

Supplementary Material 2: Additional Figures

Correcting for Model Changes in Statistical Post-Processing

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Abstract

In this supplementary note, the results for all the variables of the quasi-geostrophic system are depicted. We consider the streamfunction variables ψ_1, \dots, ψ_{10} and the temperature variables $\theta_1, \dots, \theta_{10}$, corresponding to the modes:

$$\begin{aligned} F_1(x, y) &= \sqrt{2} \cos(y), \\ F_2(x, y) &= 2 \cos(nx) \sin(y), \\ F_3(x, y) &= 2 \sin(nx) \sin(y), \\ F_4(x, y) &= \sqrt{2} \cos(2y), \\ F_5(x, y) &= 2 \cos(nx) \sin(2y), \\ F_6(x, y) &= 2 \sin(nx) \sin(2y), \\ F_7(x, y) &= 2 \cos(2nx) \sin(y), \\ F_8(x, y) &= 2 \sin(2nx) \sin(y), \\ F_9(x, y) &= 2 \cos(2nx) \sin(2y), \\ F_{10}(x, y) &= 2 \sin(2nx) \sin(2y), \end{aligned}$$

Each variables have been corrected by using itself as the unique predictor, according to the different models and methods described in the main article. Three figures per variable are shown in the following order:

1. The corrections of the moments of the variable (similar to Figs. 5 and 7 of the main article).
2. The performance of the correction (similar to Figs. 6 and 8 of the main article).
3. The comparison of the efficiency of the response theory correction for different numbers m of trajectories (similar to Fig. 10 of the main article).

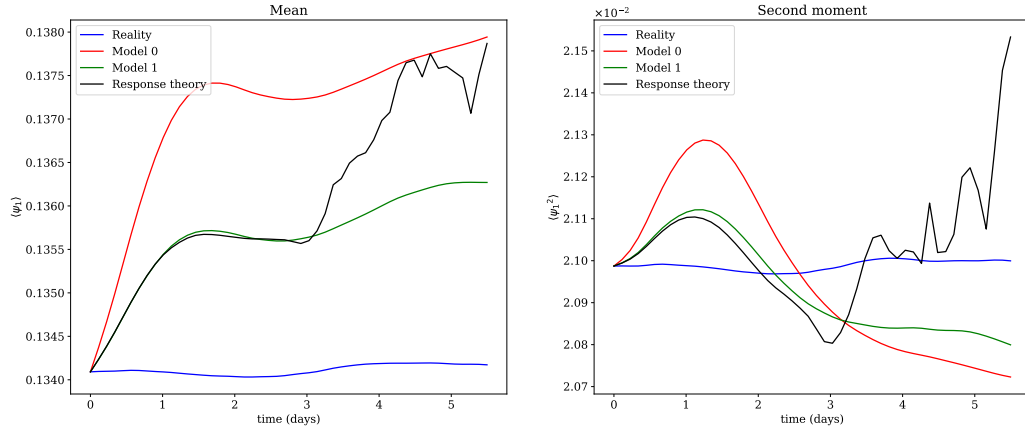
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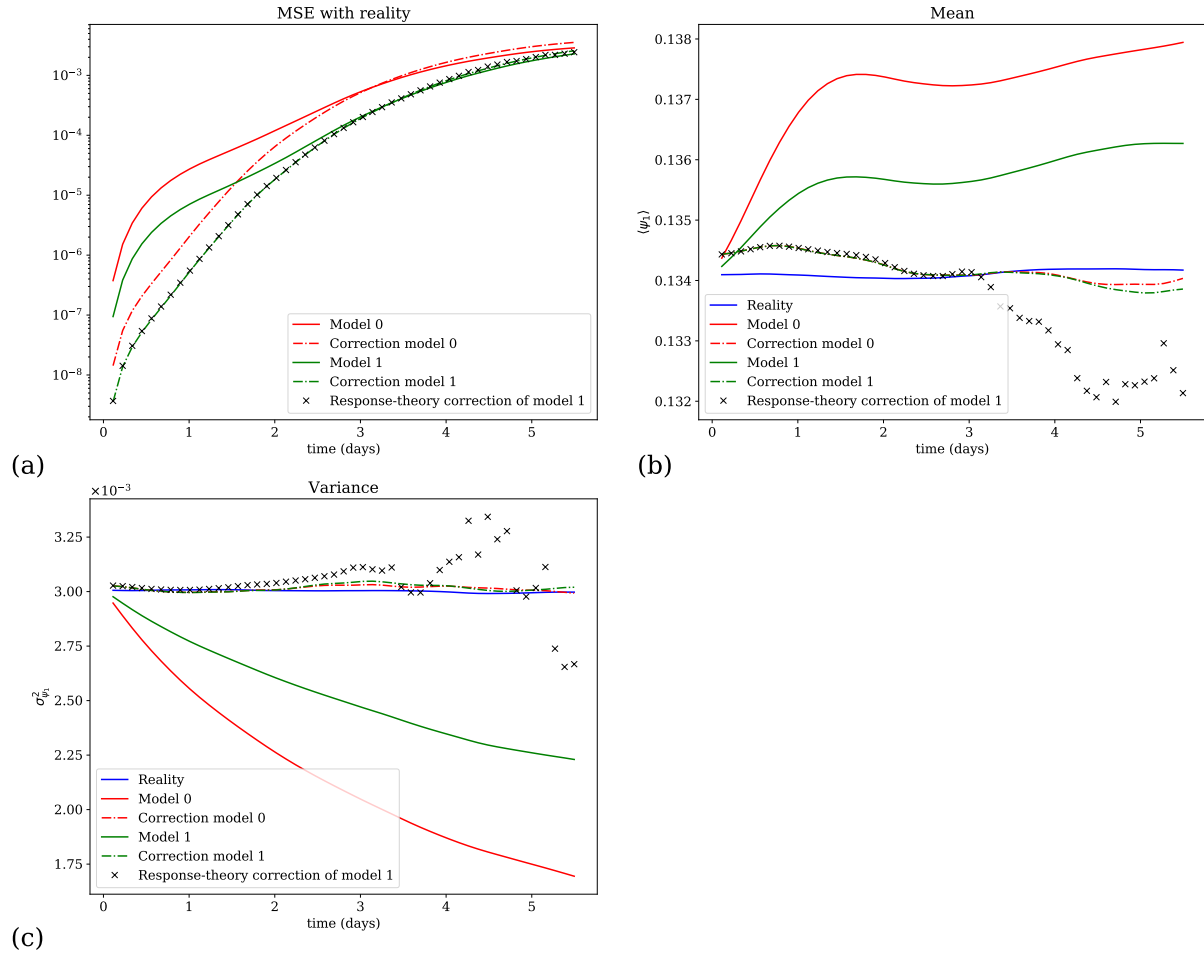
1 Experiment varying the friction coefficient

1.1 Variable ψ_1

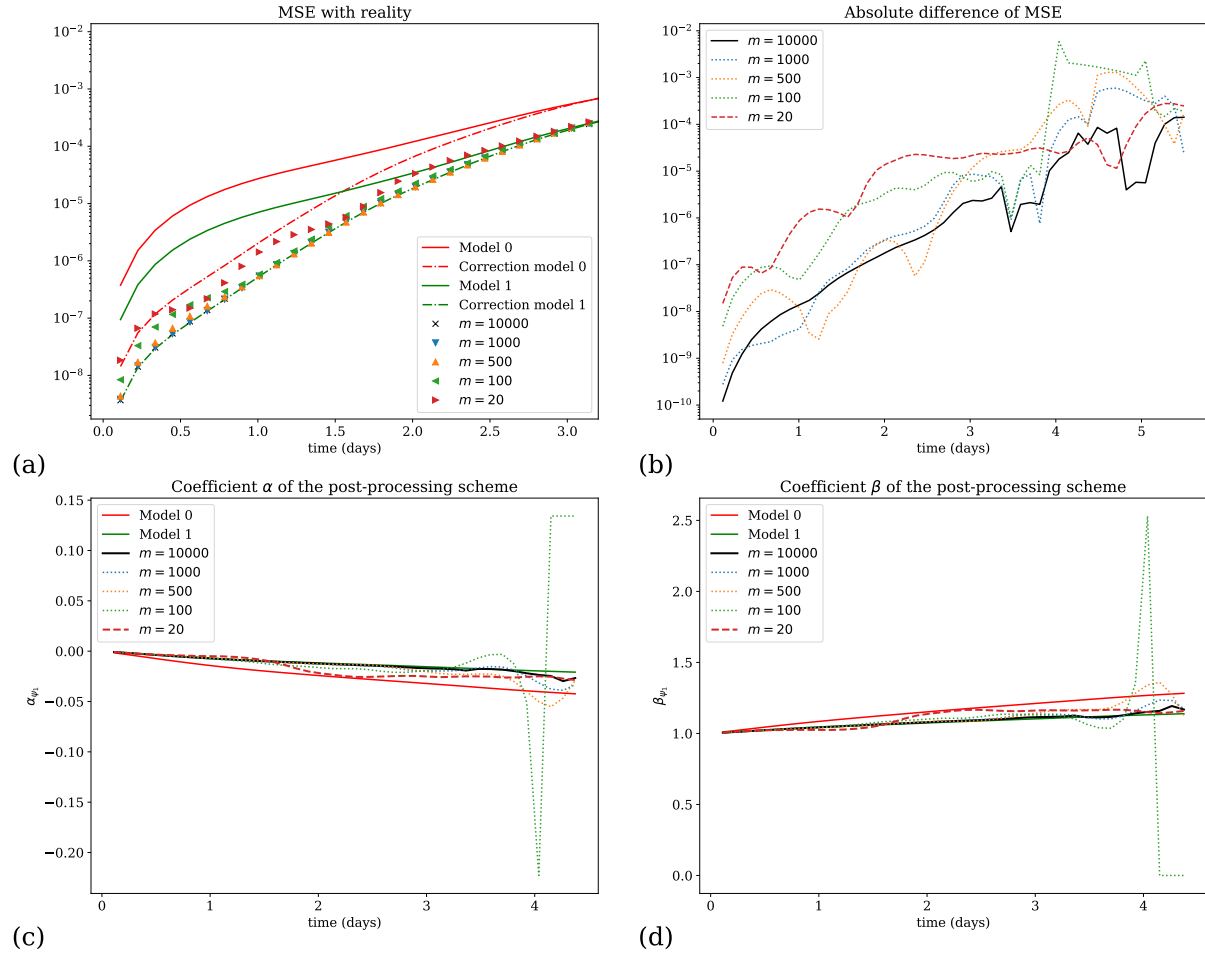
1.1.1 Corrections of the moments of the variable



1.1.2 Performance of the correction

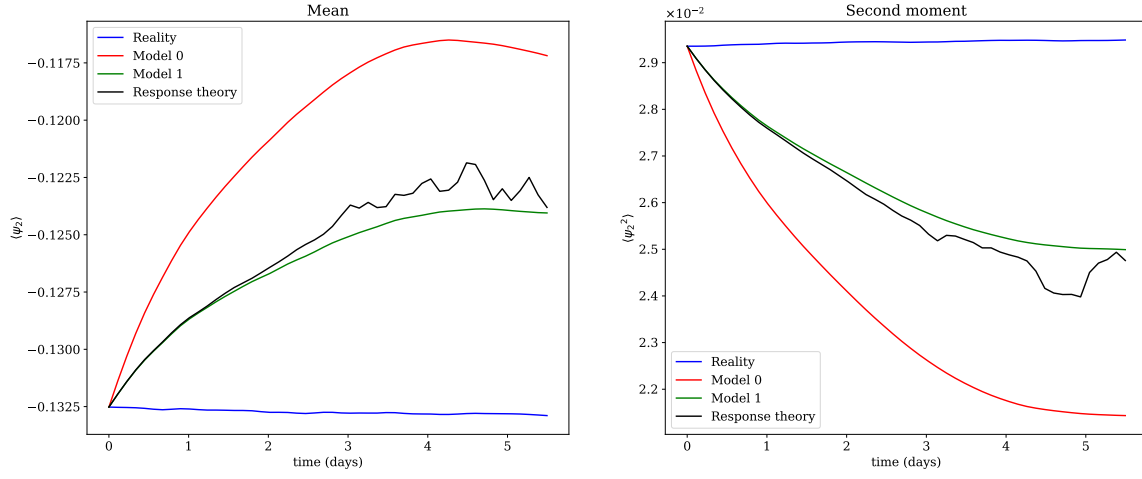


1.1.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

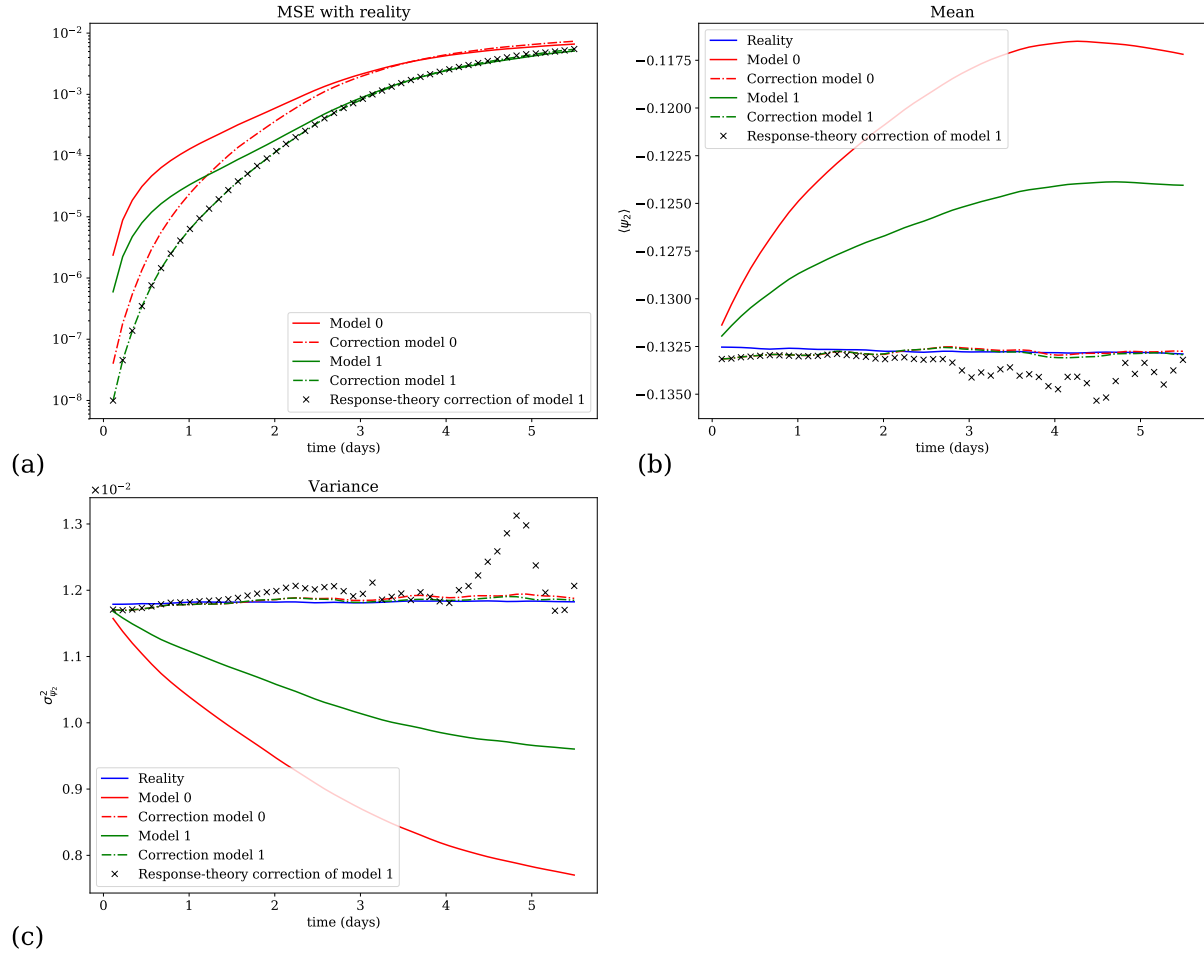


1.2 Variable ψ_2

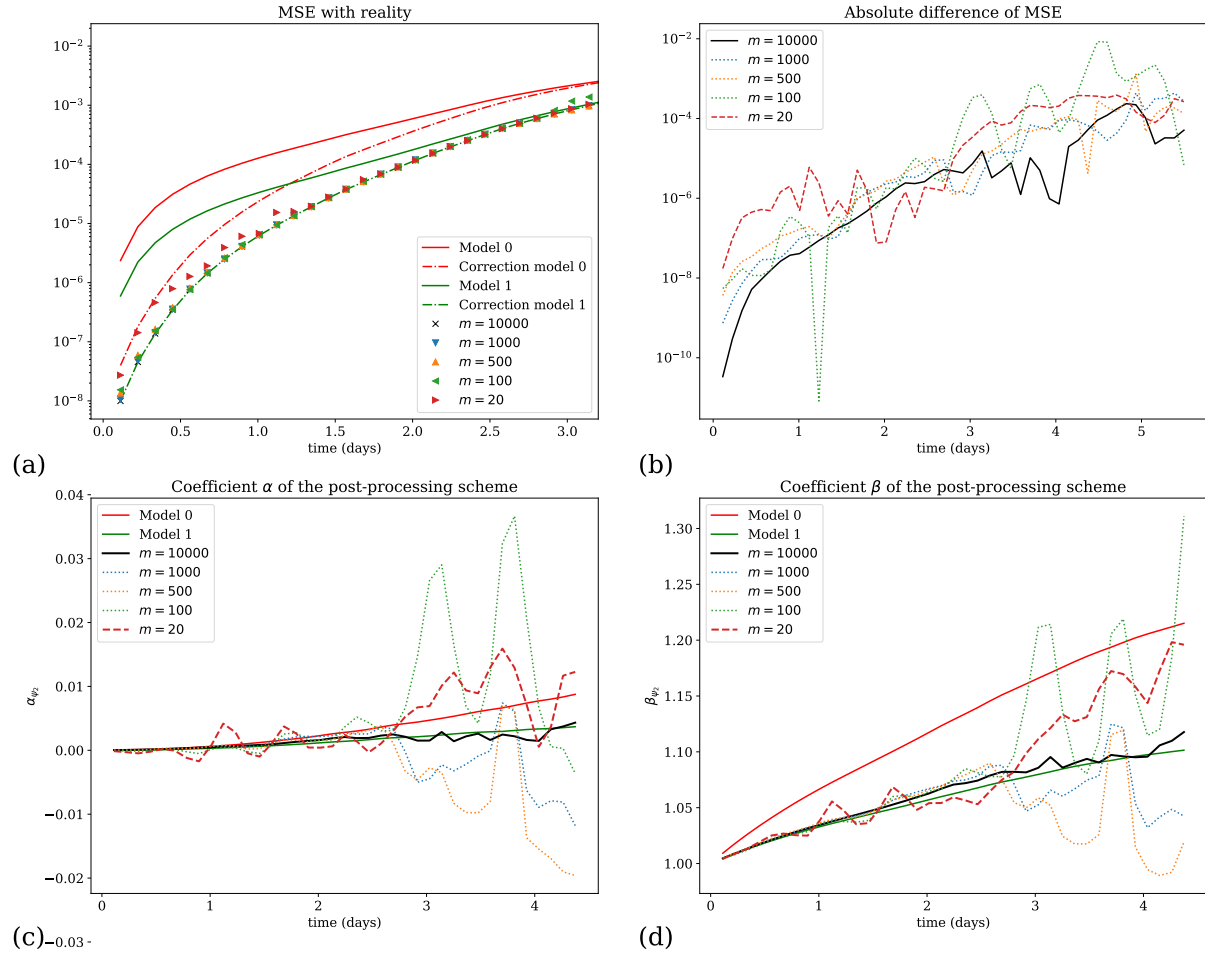
1.2.1 Corrections of the moments of the variable



1.2.2 Performance of the correction

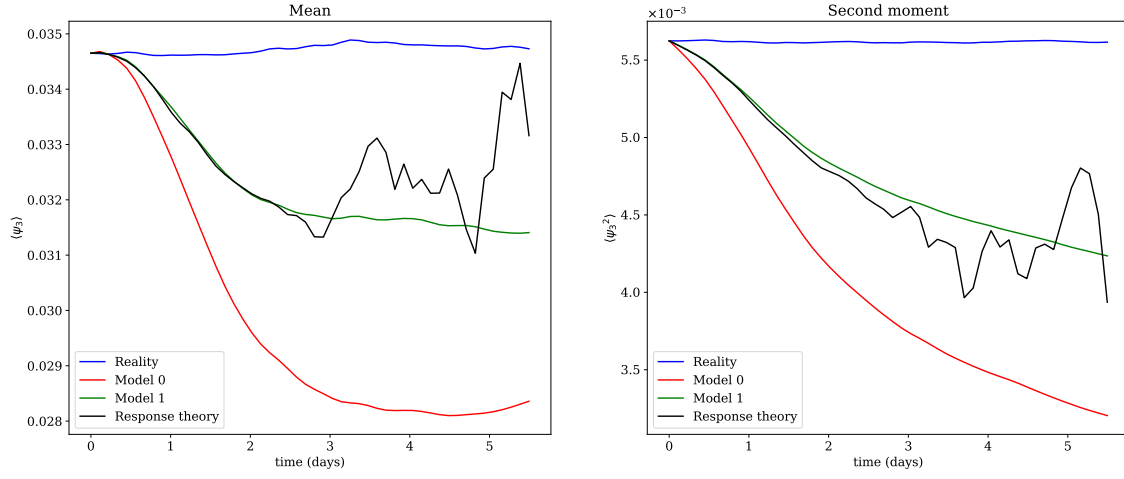


1.2.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

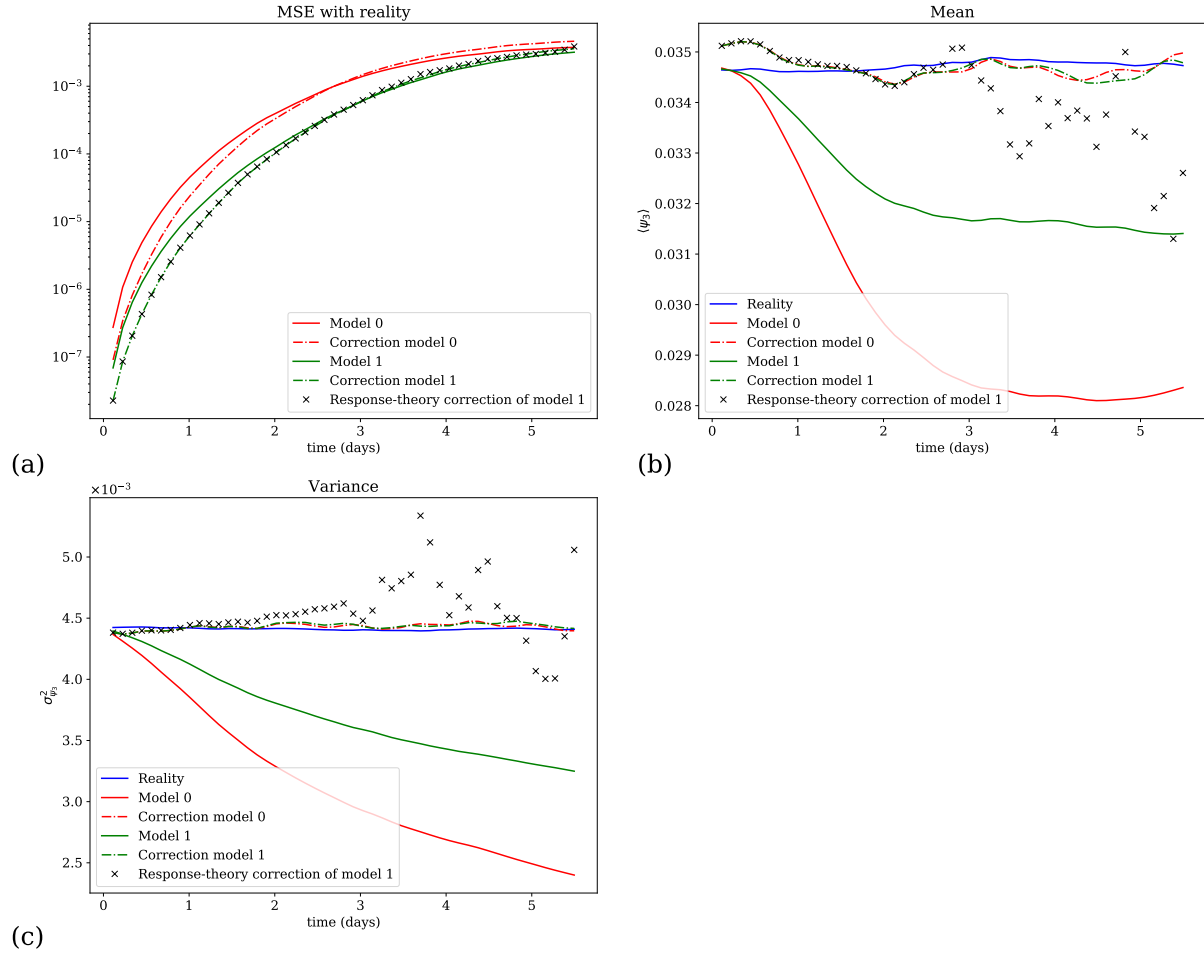


1.3 Variable ψ_3

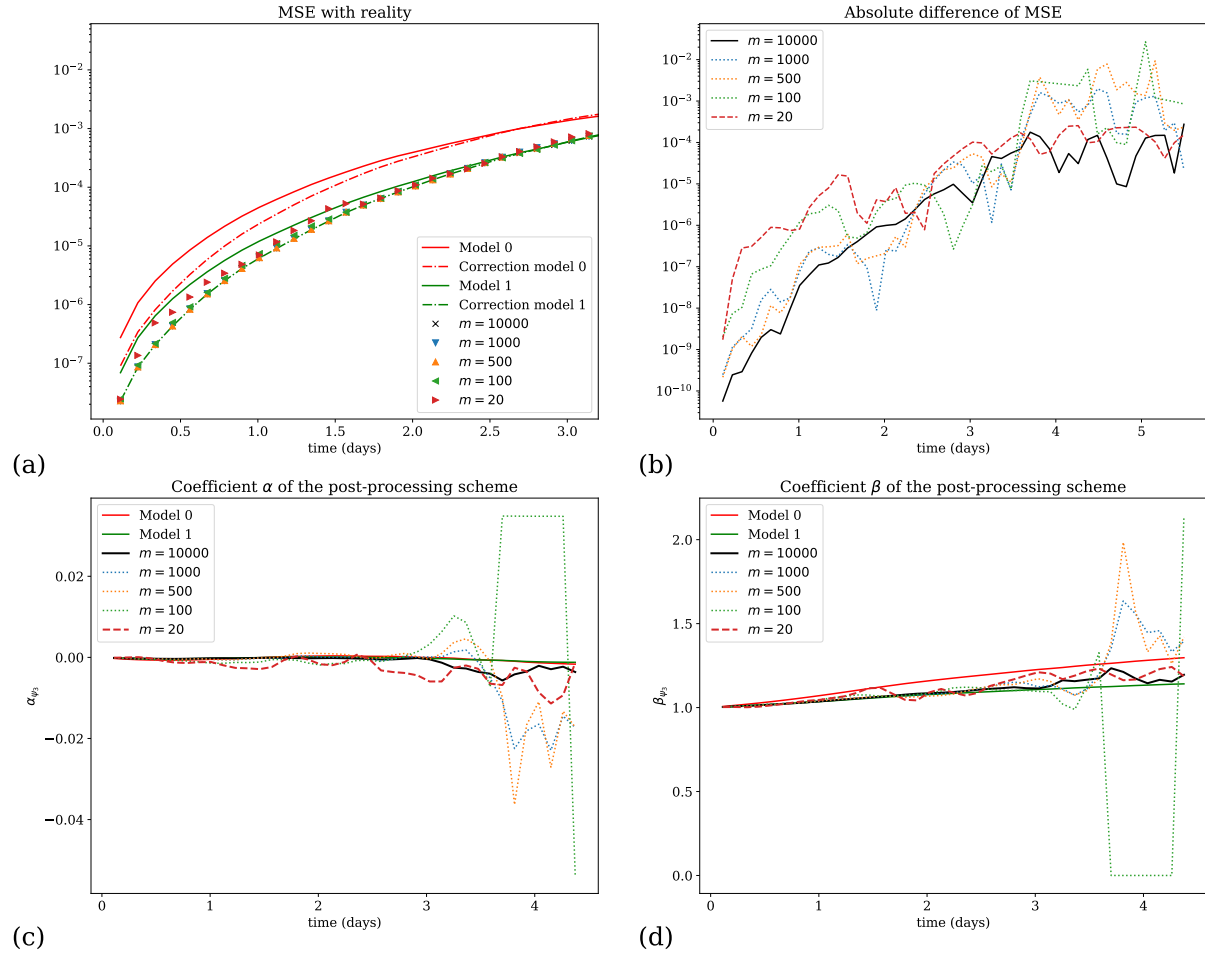
1.3.1 Corrections of the moments of the variable



1.3.2 Performance of the correction

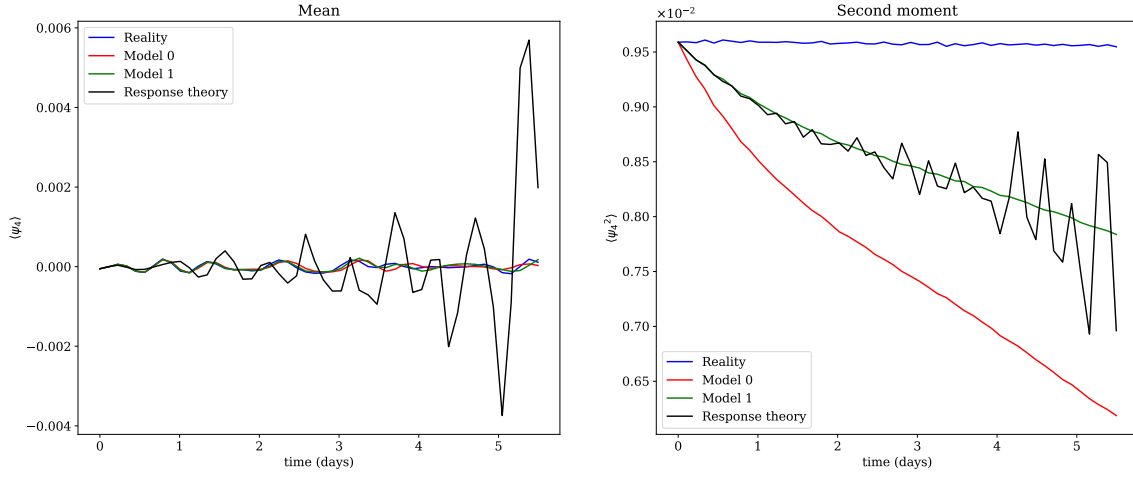


1.3.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

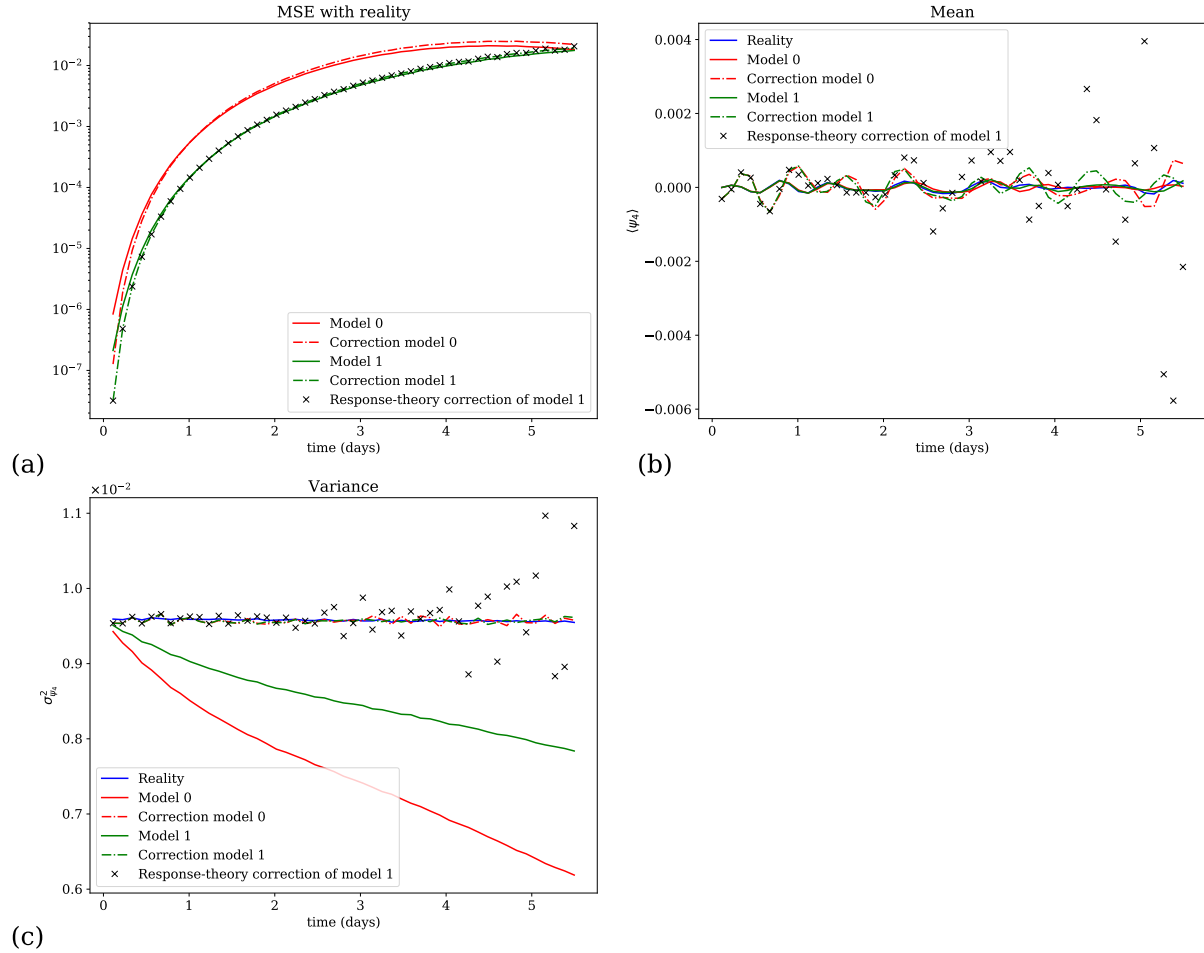


1.4 Variable ψ_4

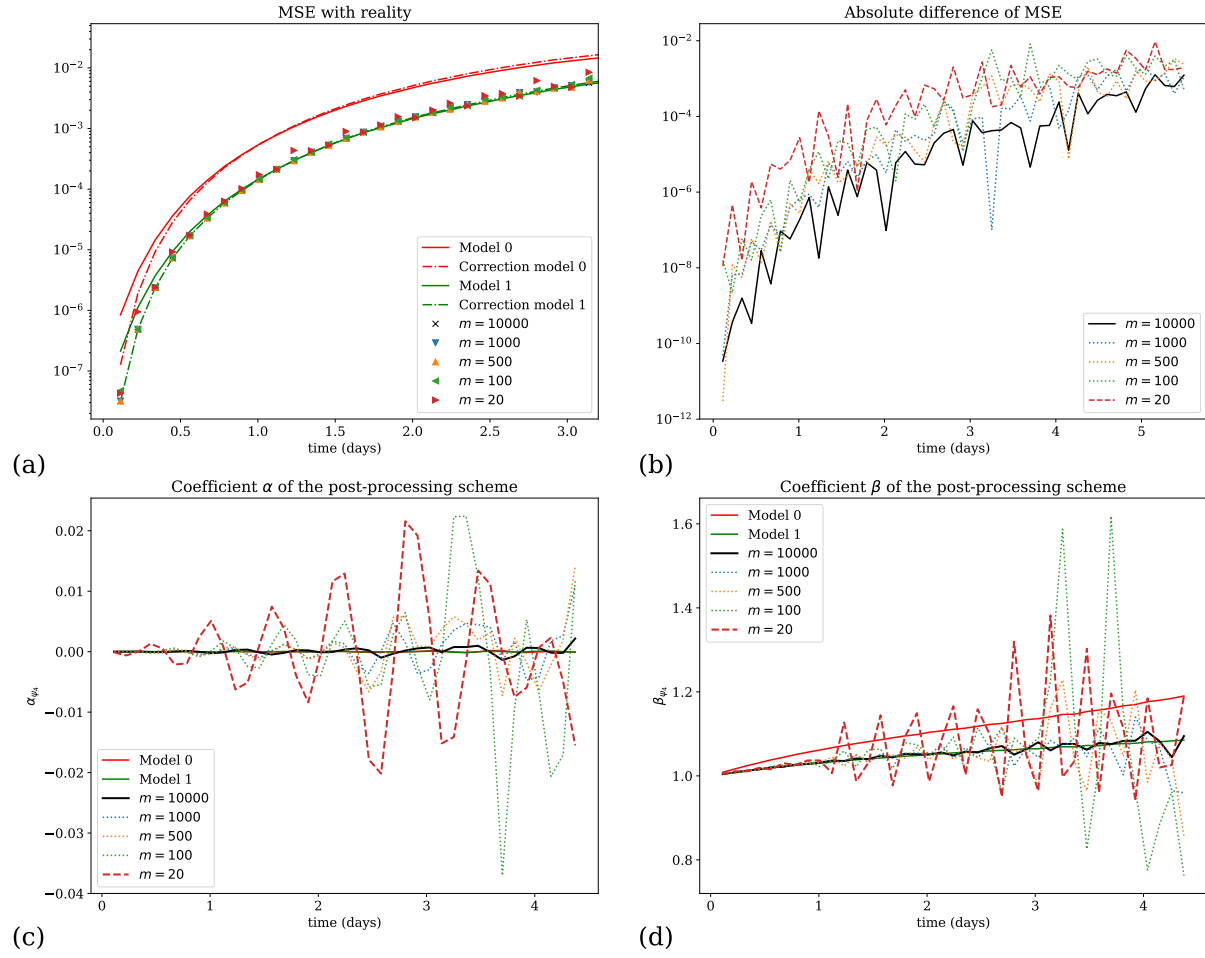
1.4.1 Corrections of the moments of the variable



1.4.2 Performance of the correction

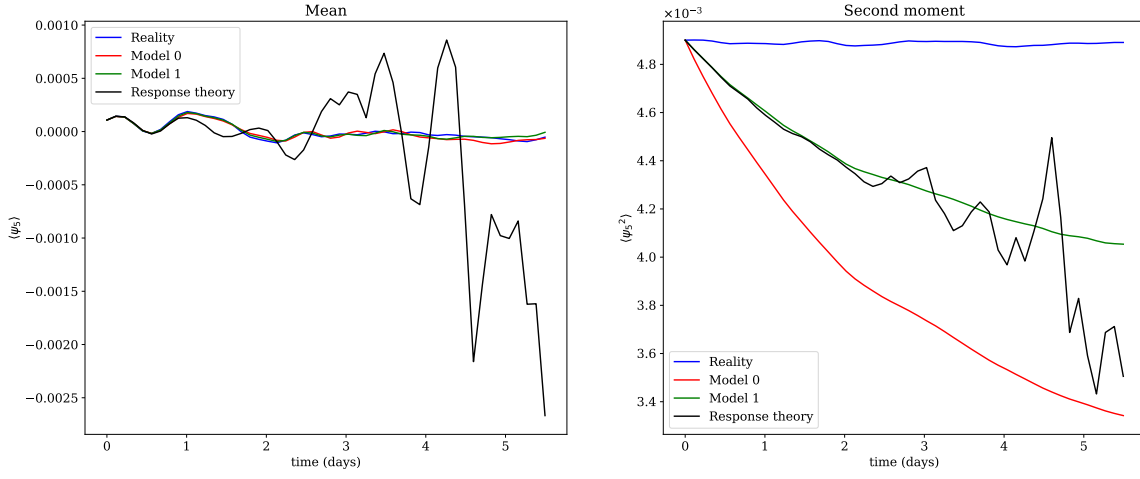


1.4.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

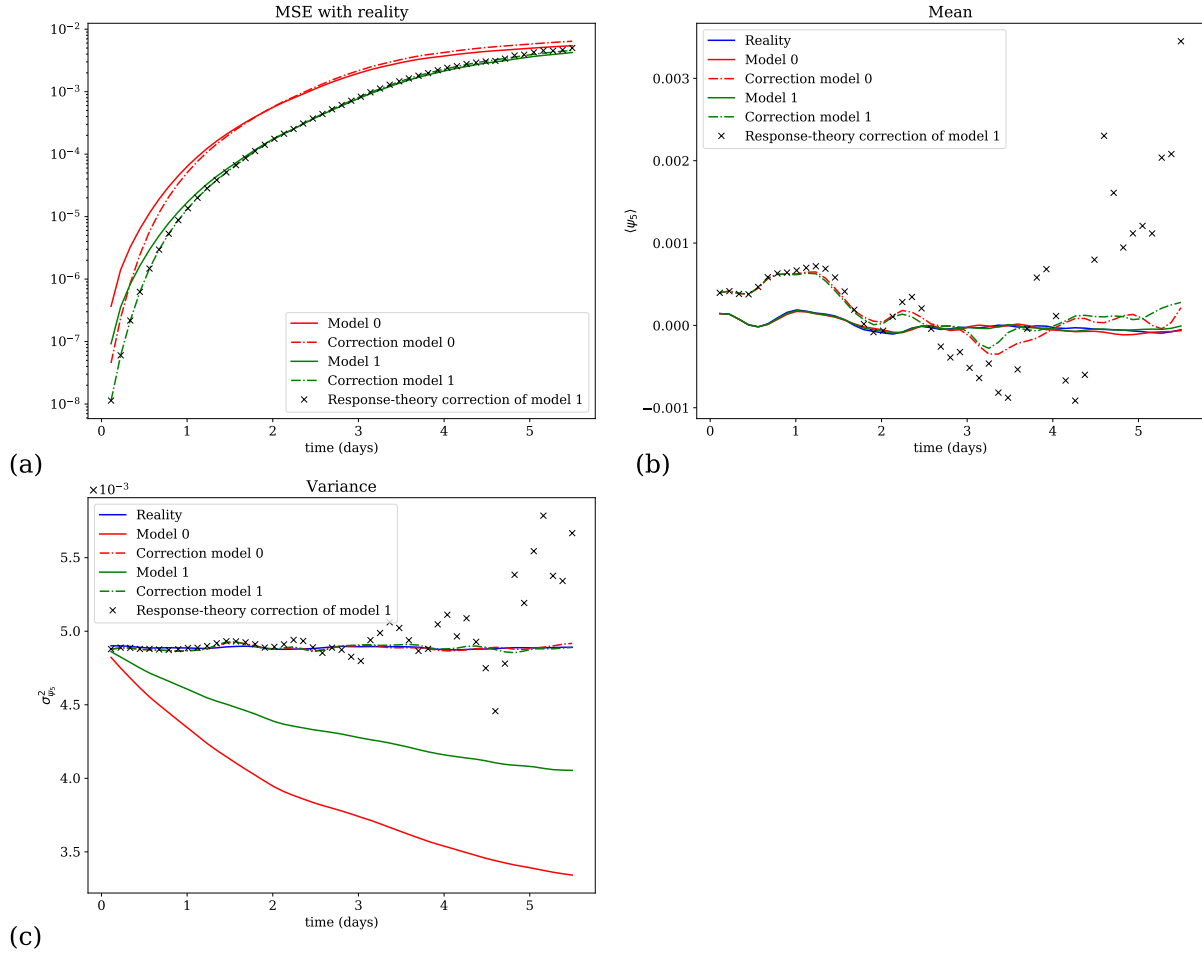


1.5 Variable ψ_5

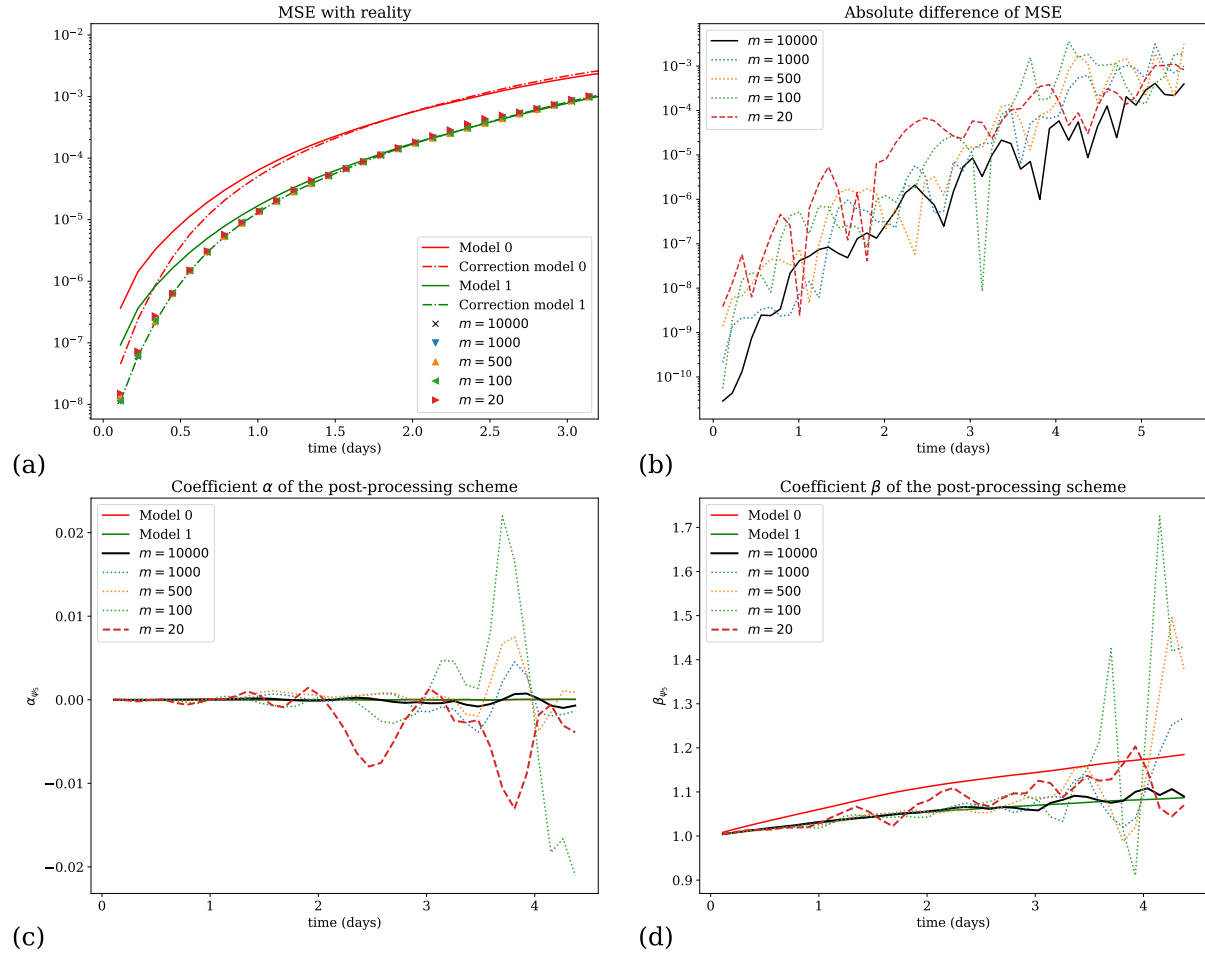
1.5.1 Corrections of the moments of the variable



1.5.2 Performance of the correction

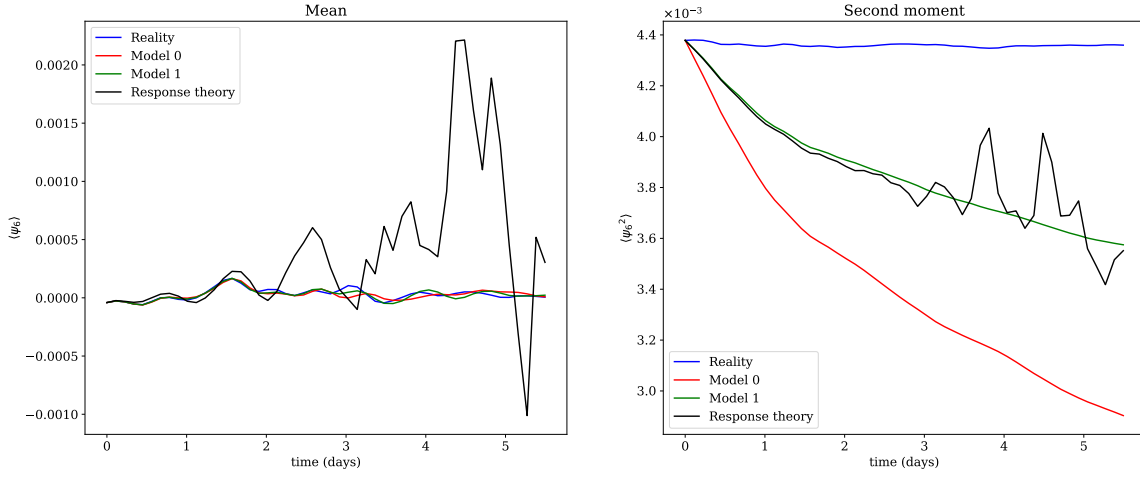


1.5.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

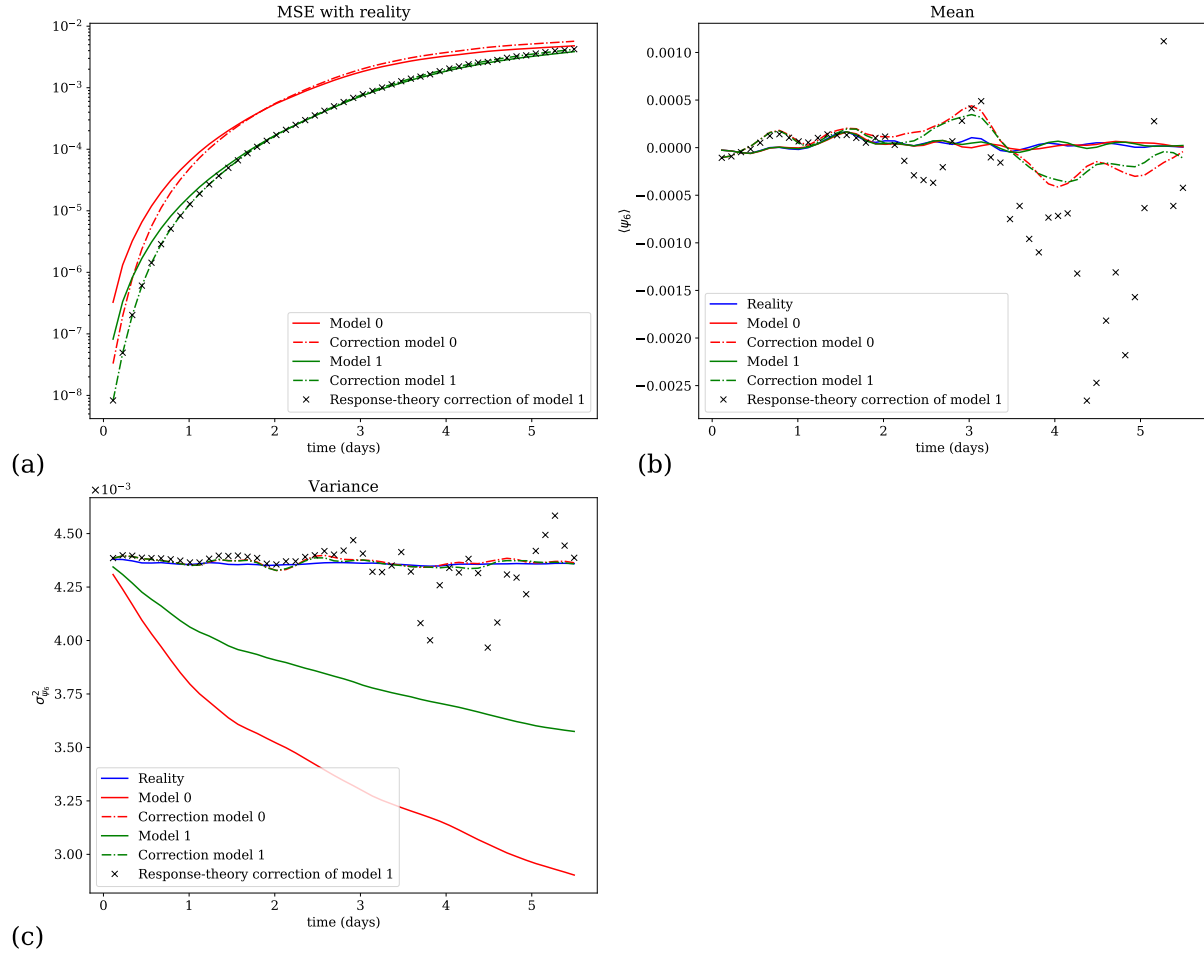


1.6 Variable ψ_6

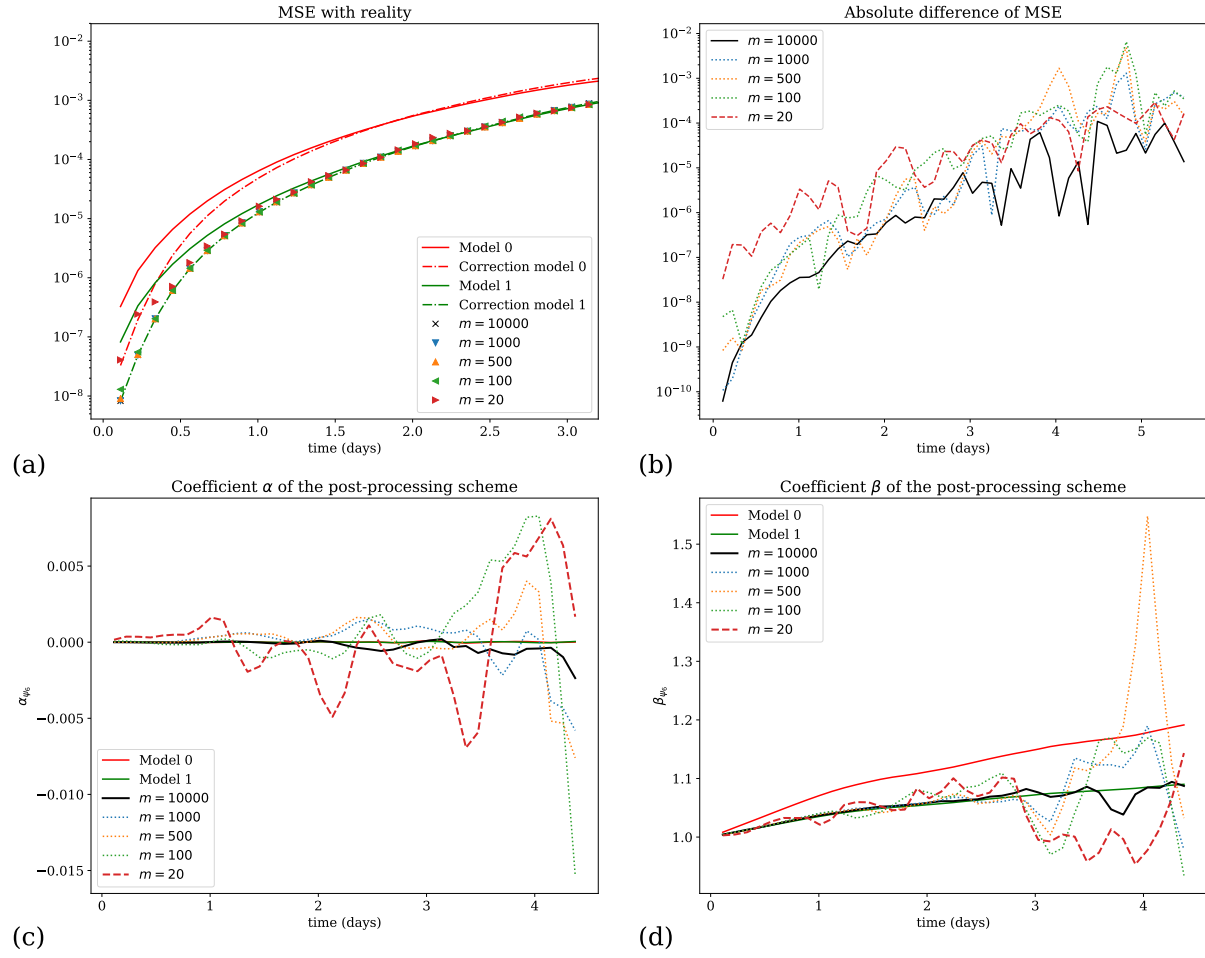
1.6.1 Corrections of the moments of the variable



1.6.2 Performance of the correction

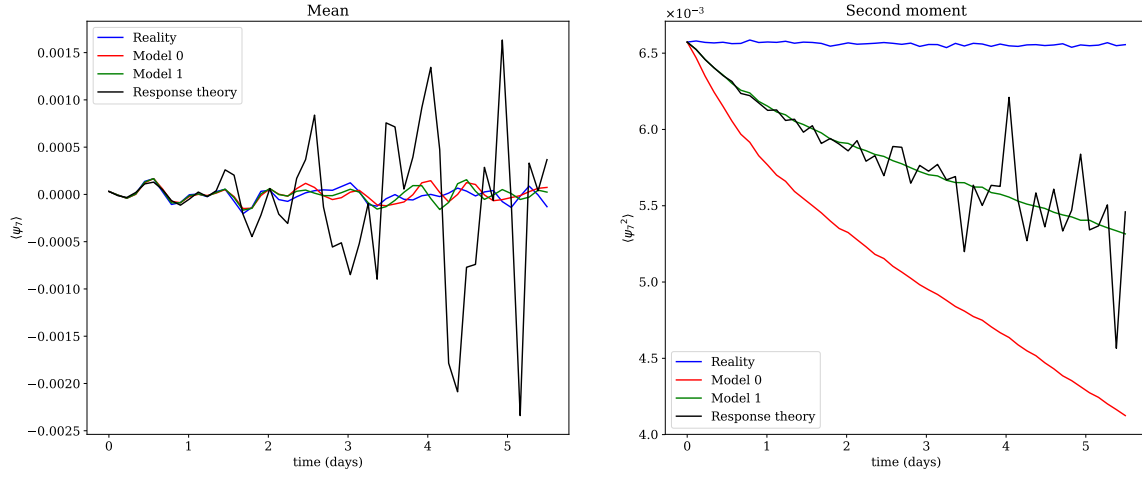


1.6.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

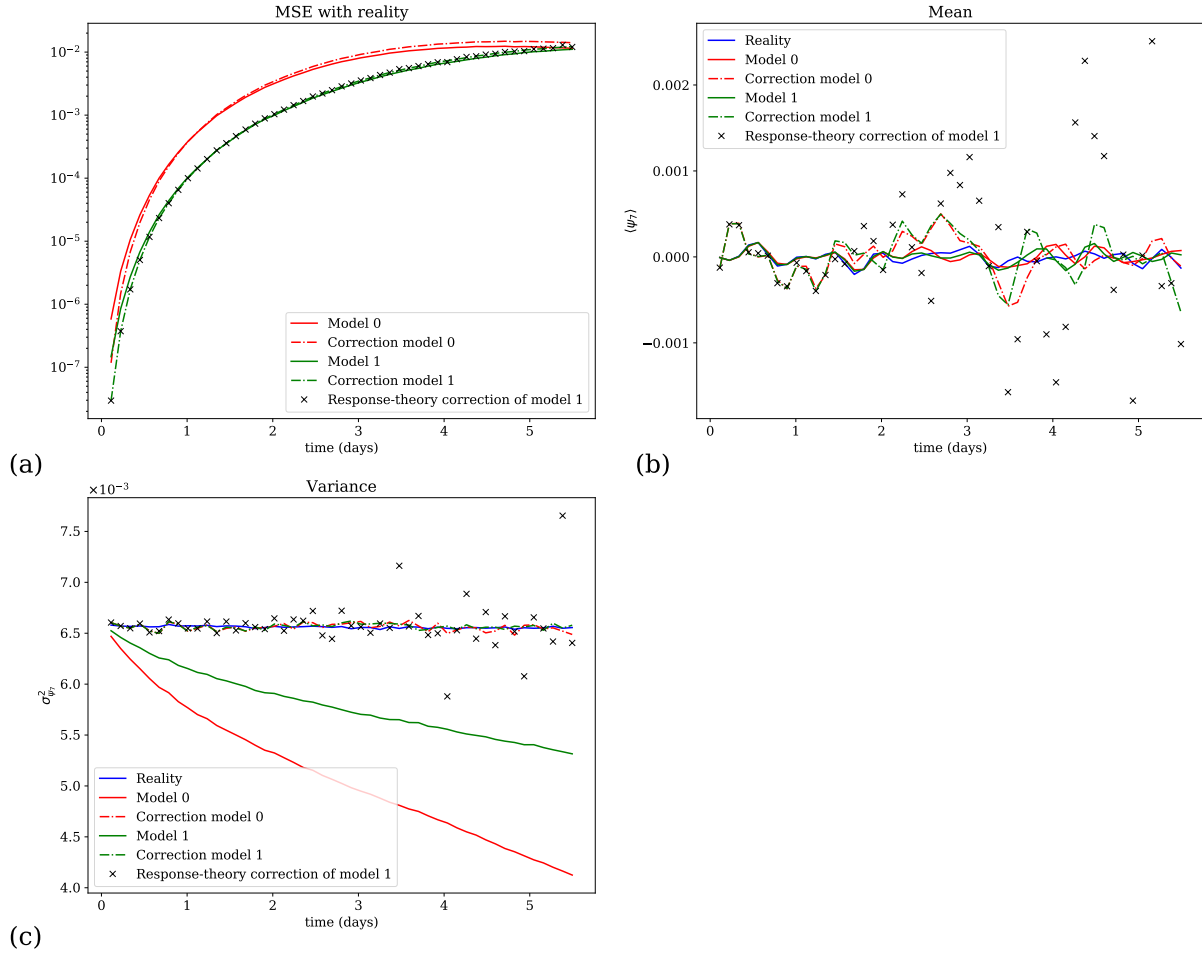


1.7 Variable ψ_7

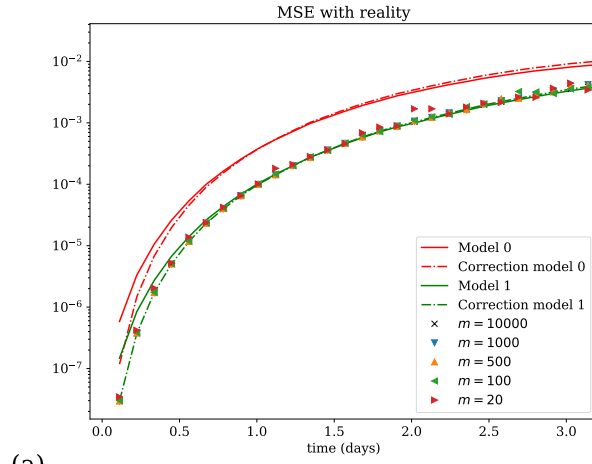
1.7.1 Corrections of the moments of the variable



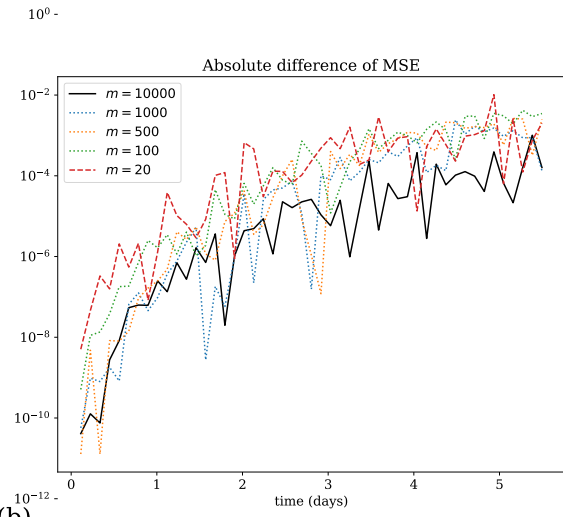
1.7.2 Performance of the correction



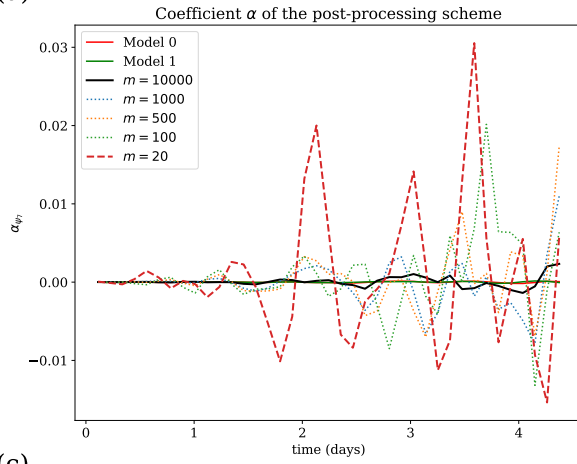
1.7.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories



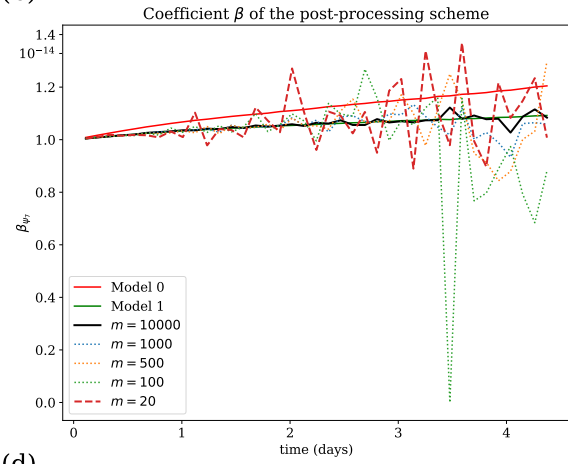
(a)



(b)



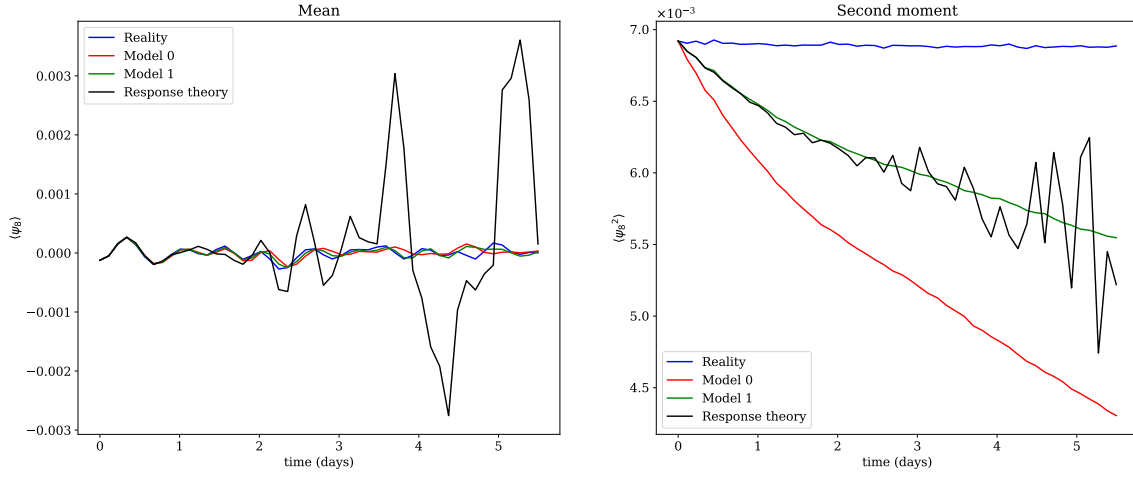
(c)



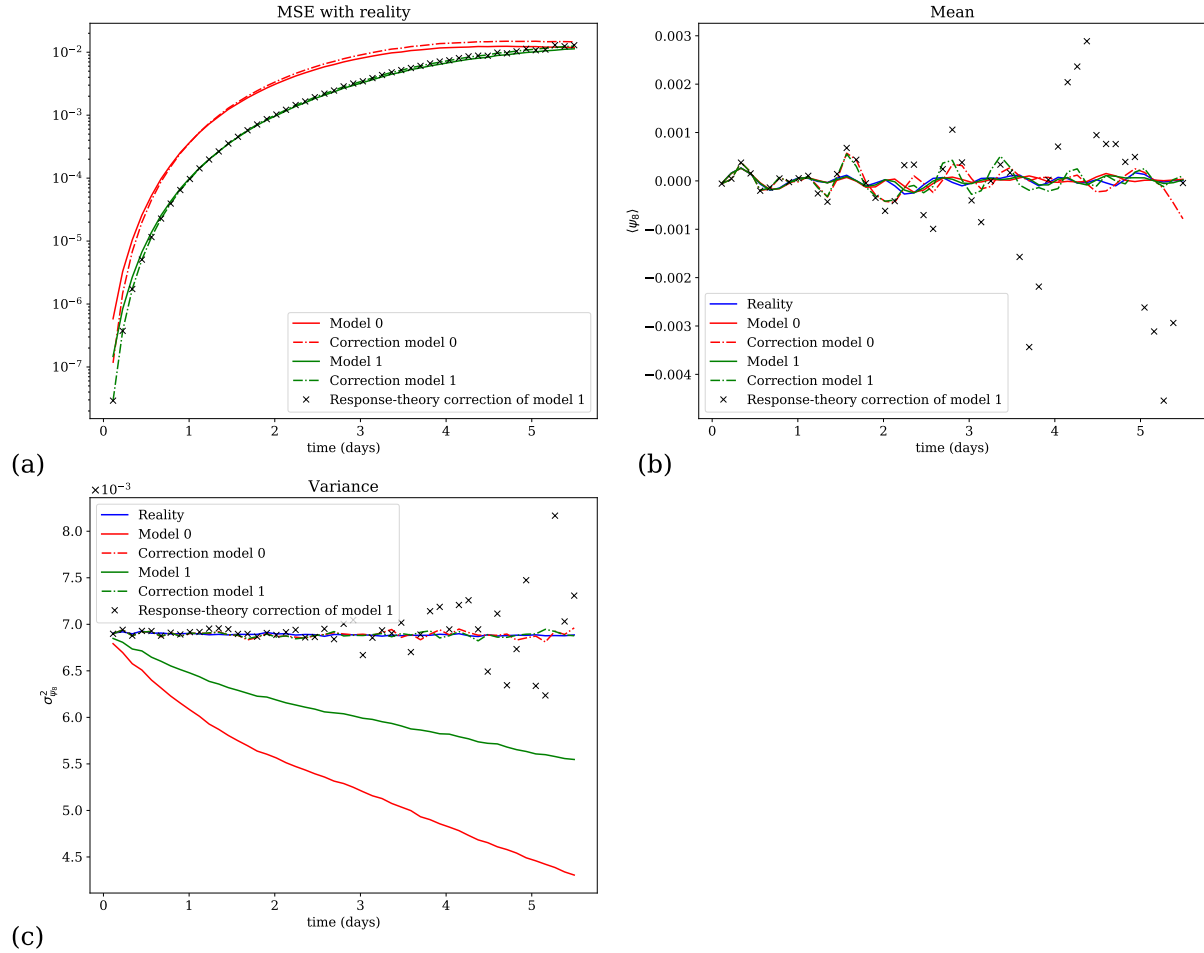
(d)

1.8 Variable ψ_8

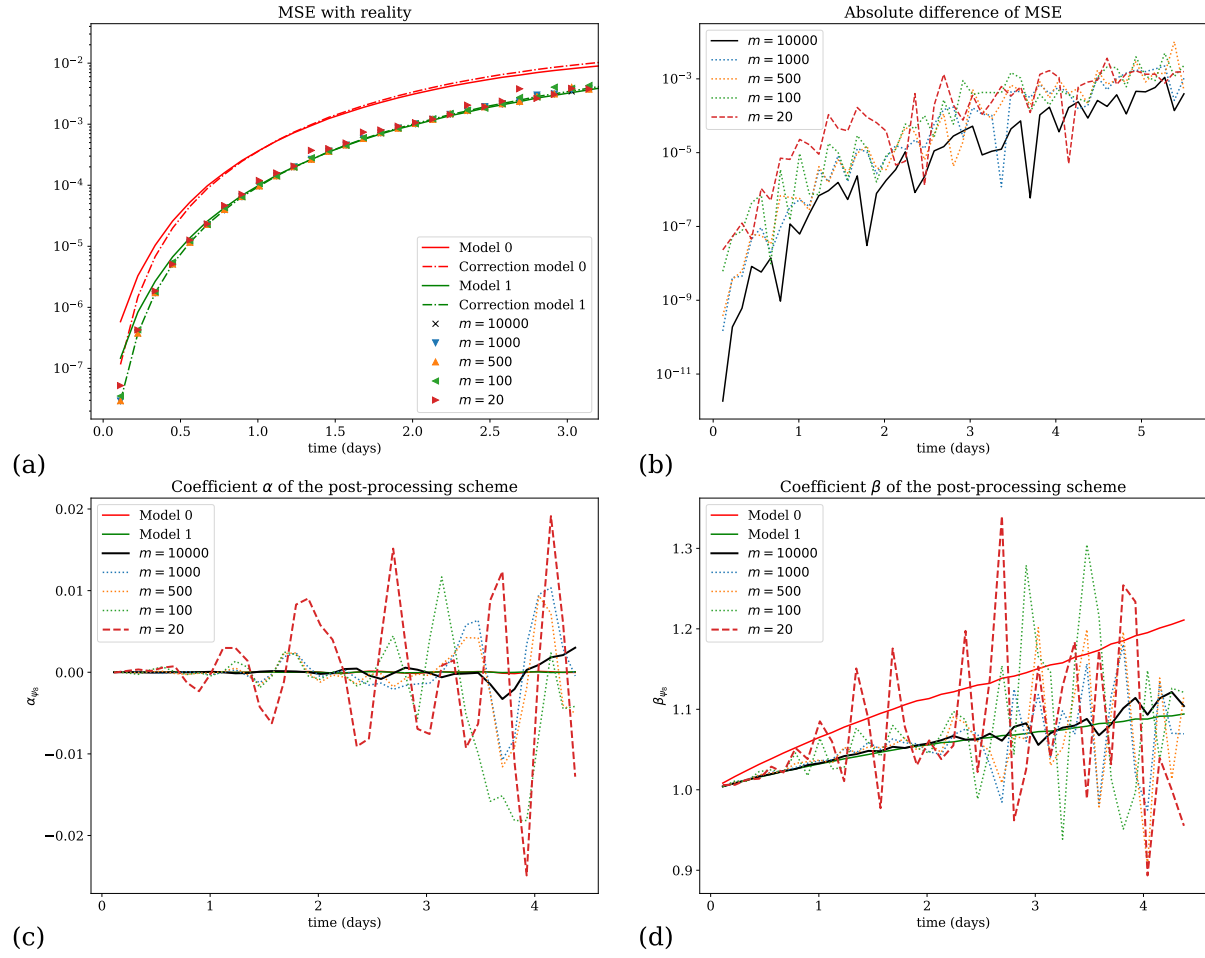
1.8.1 Corrections of the moments of the variable



1.8.2 Performance of the correction

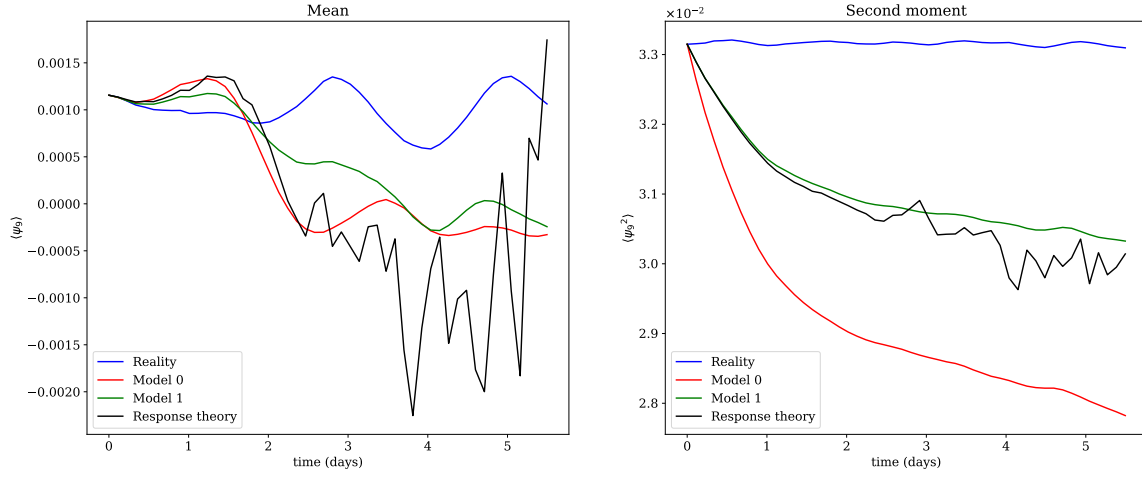


1.8.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

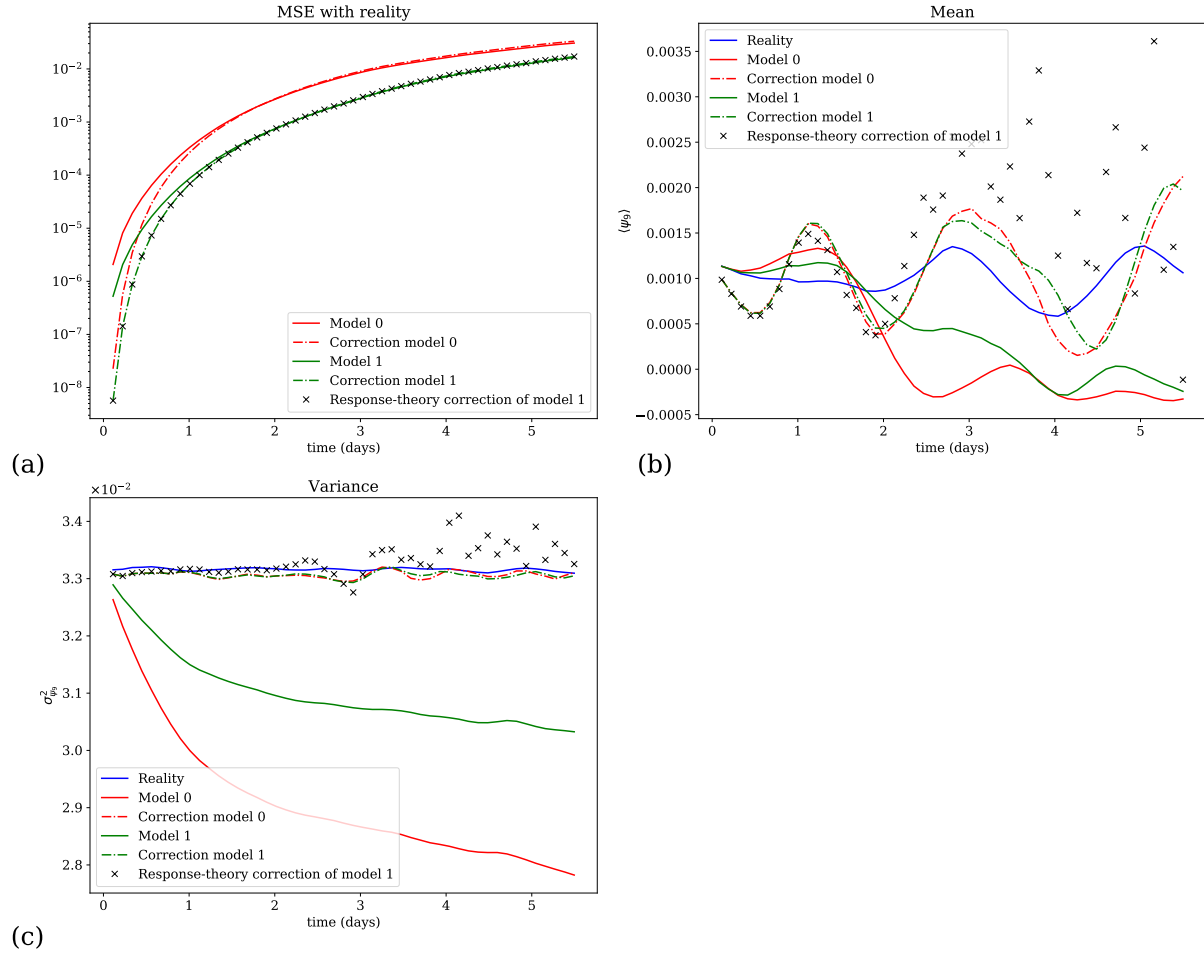


1.9 Variable ψ_9

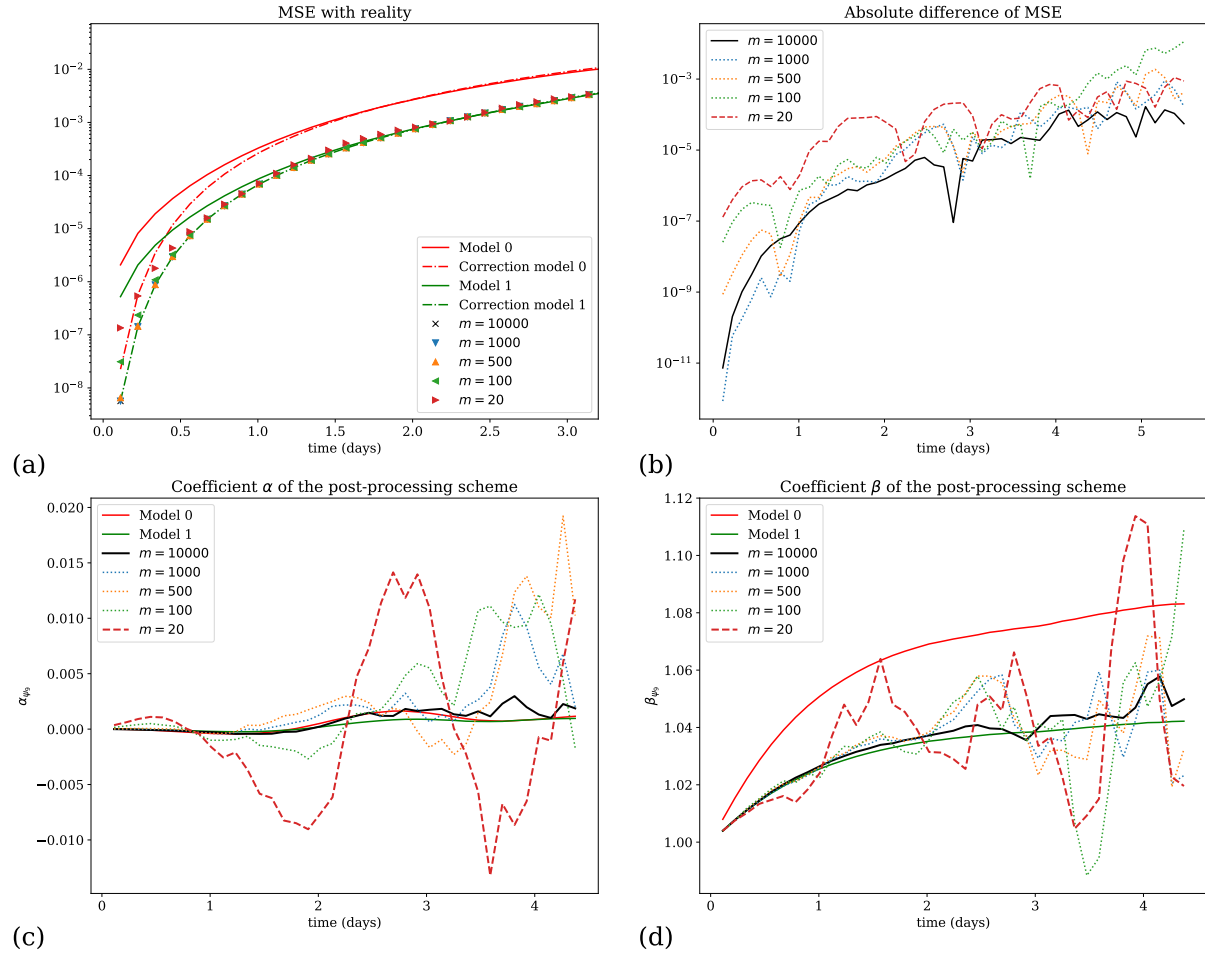
1.9.1 Corrections of the moments of the variable



1.9.2 Performance of the correction

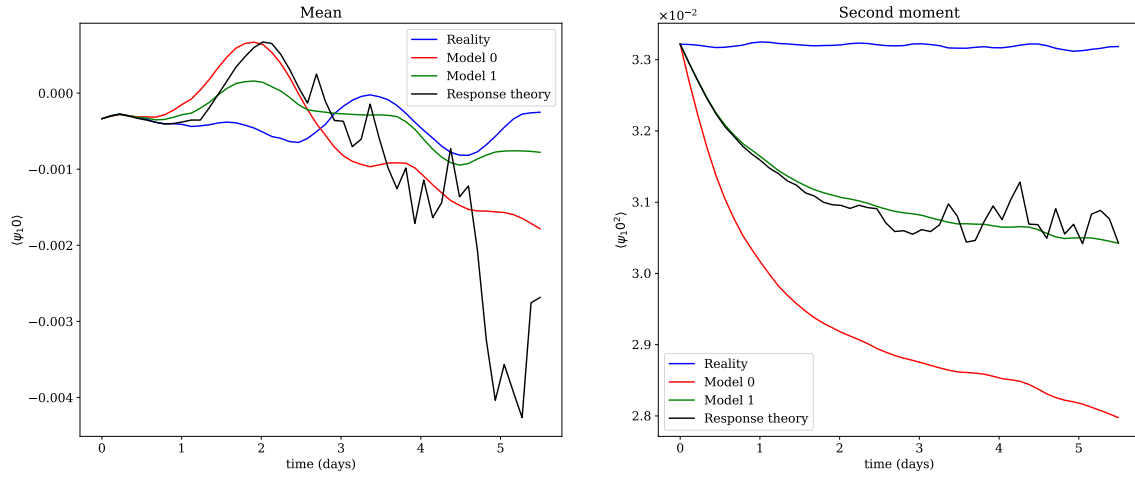


1.9.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

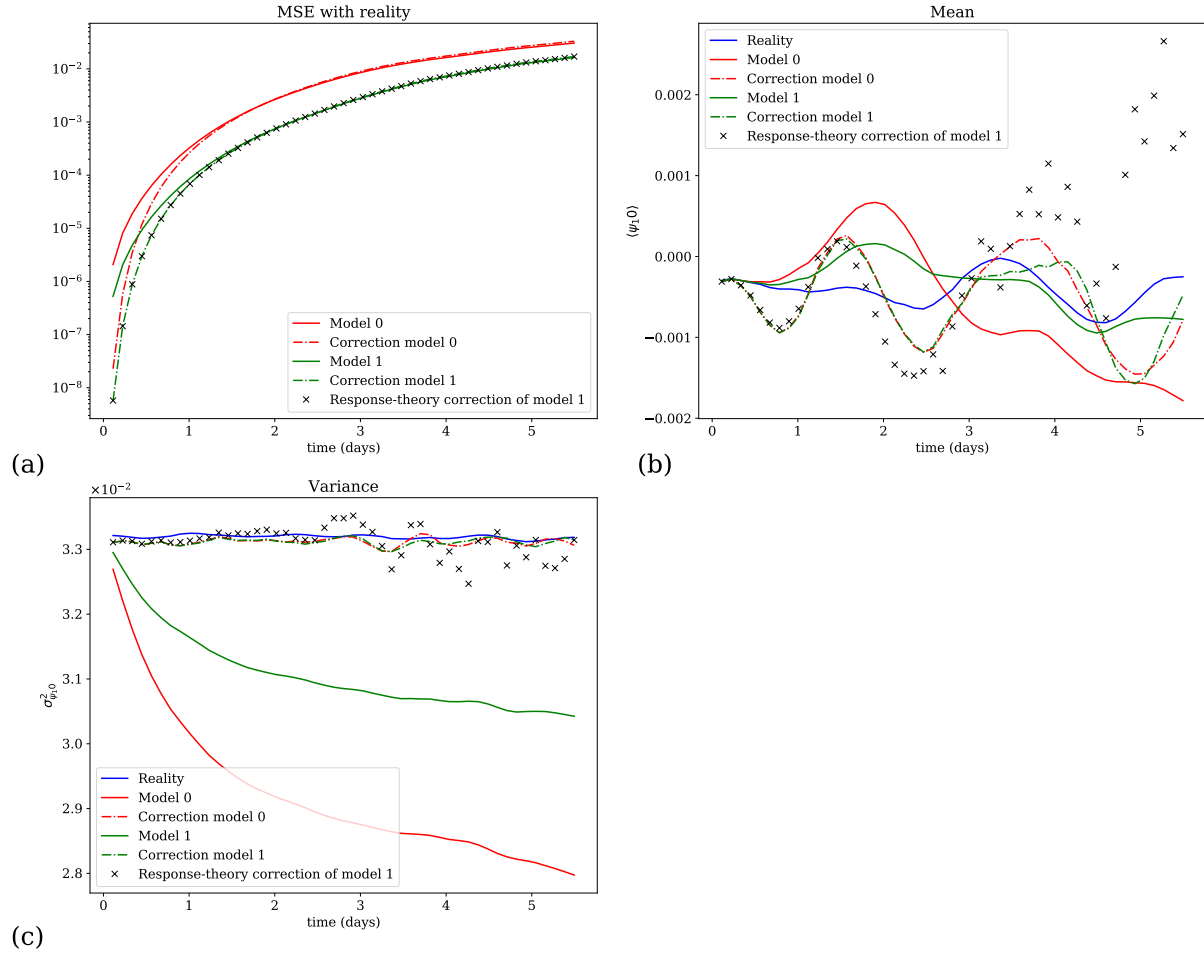


1.10 Variable ψ_{10}

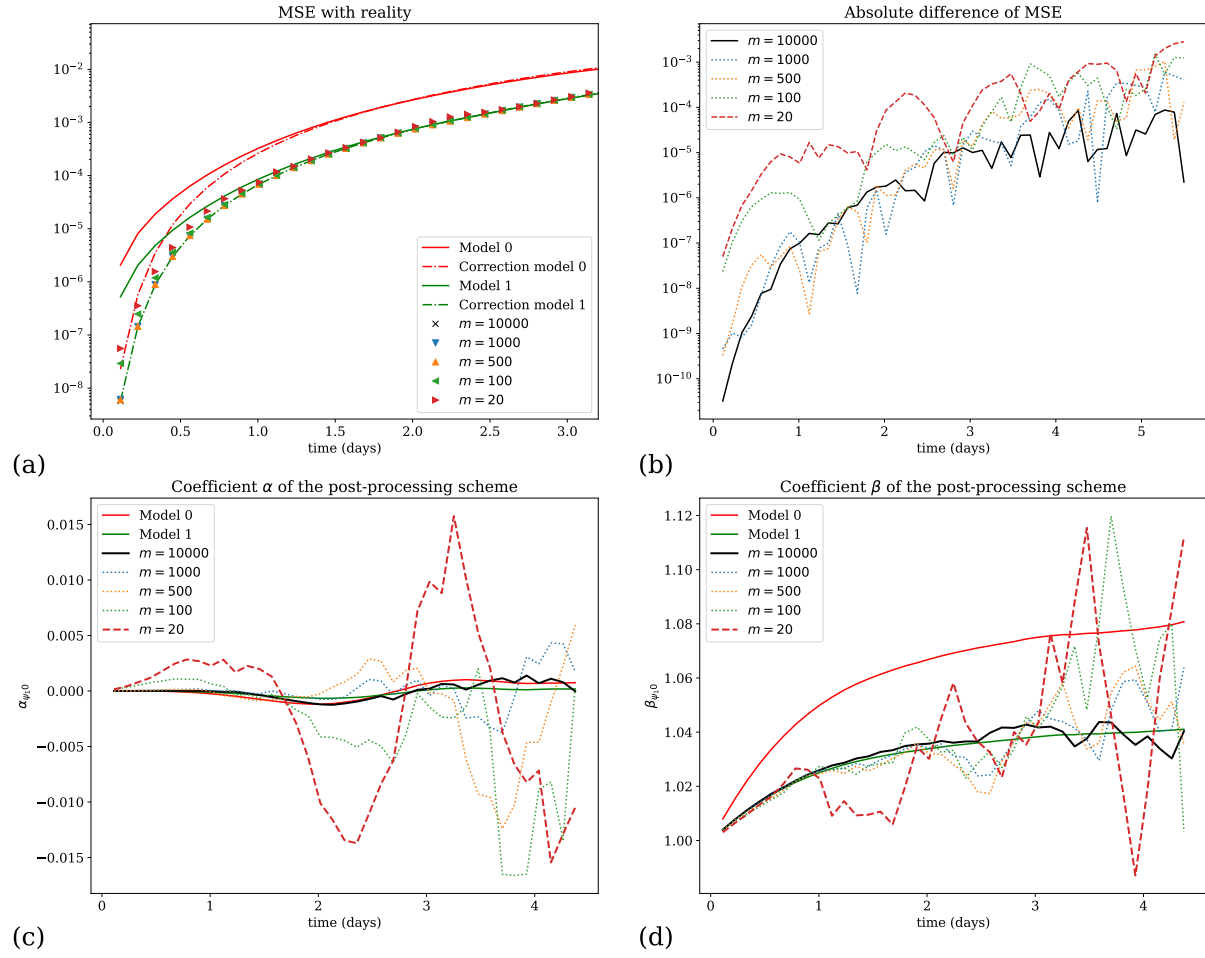
1.10.1 Corrections of the moments of the variable



1.10.2 Performance of the correction

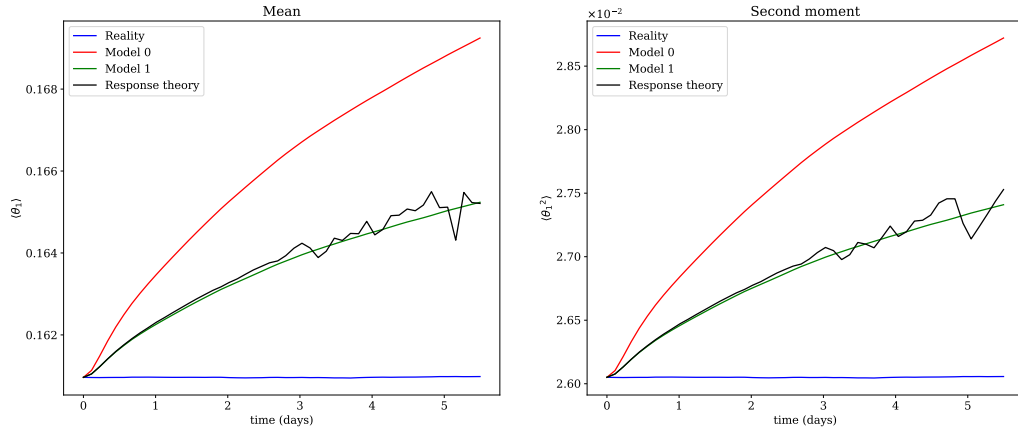


1.10.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

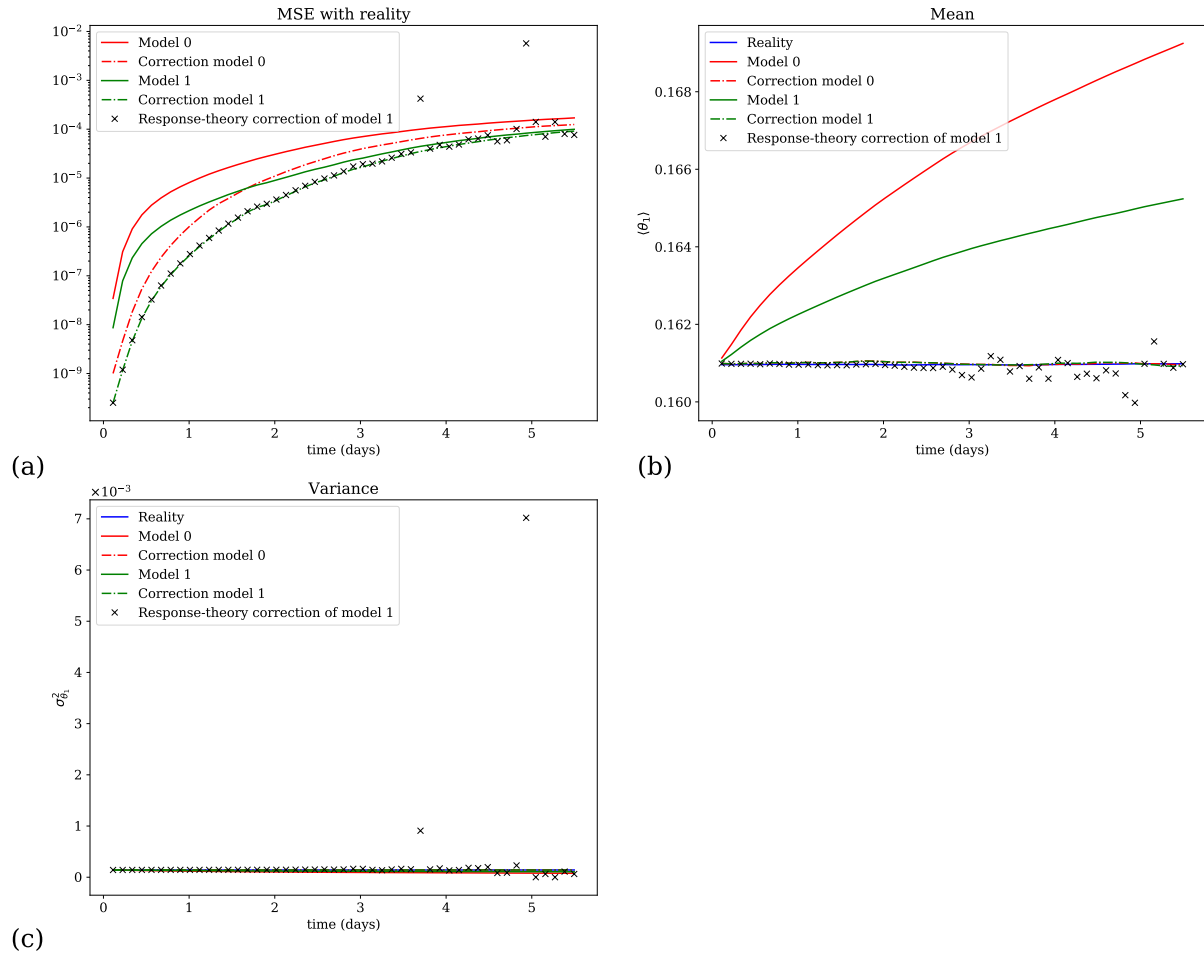


1.11 Variable θ_1

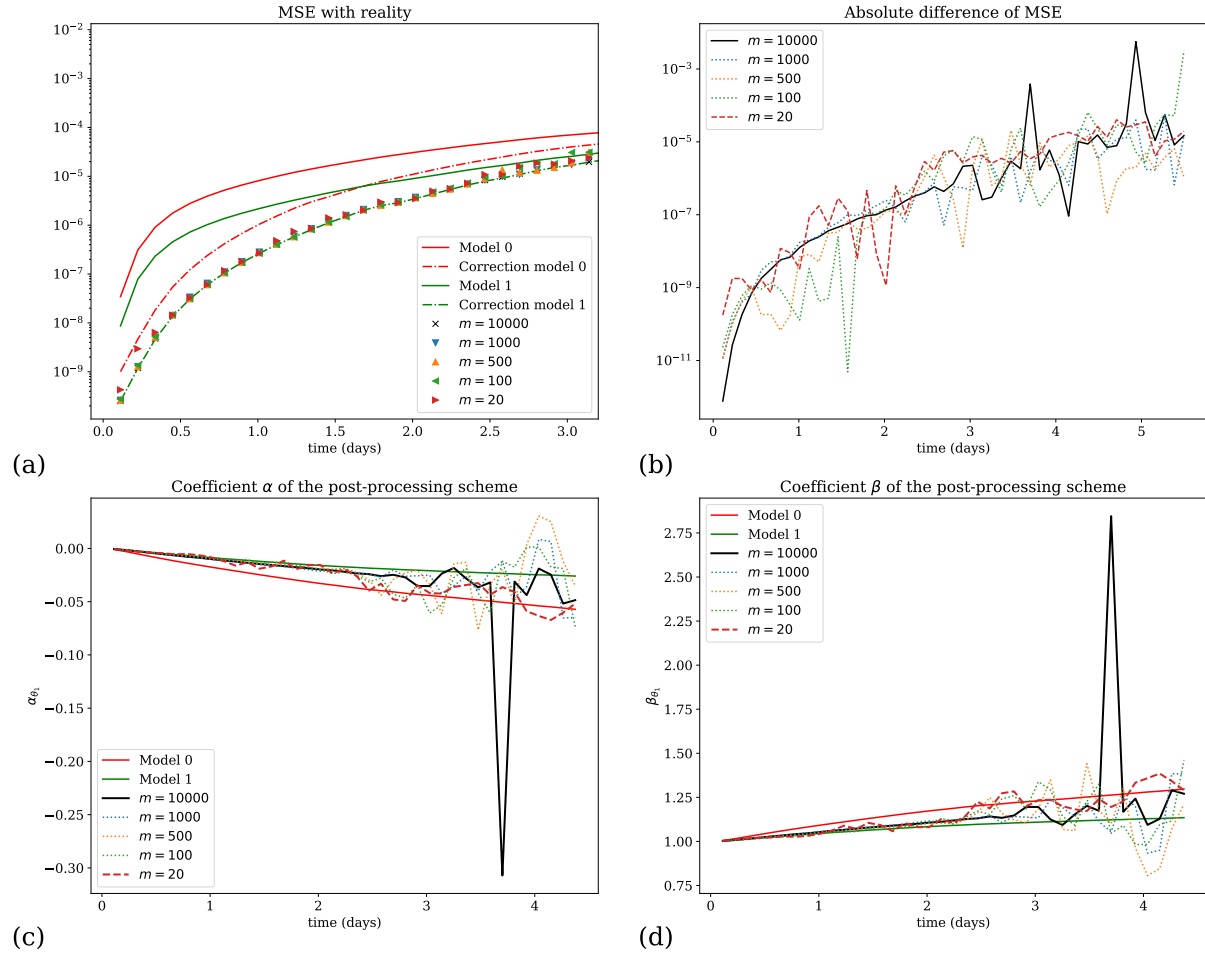
1.11.1 Corrections of the moments of the variable



1.11.2 Performance of the correction

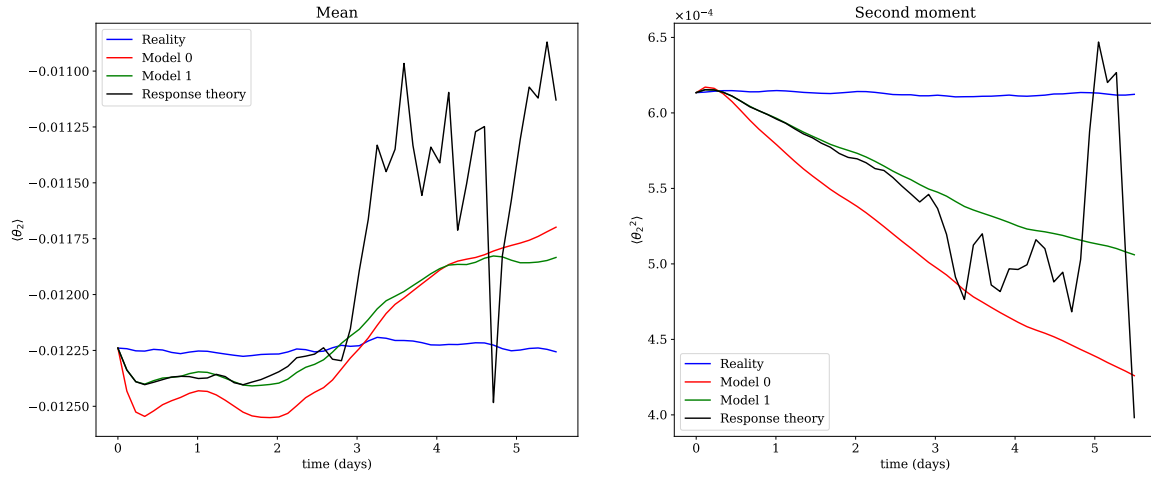


1.11.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

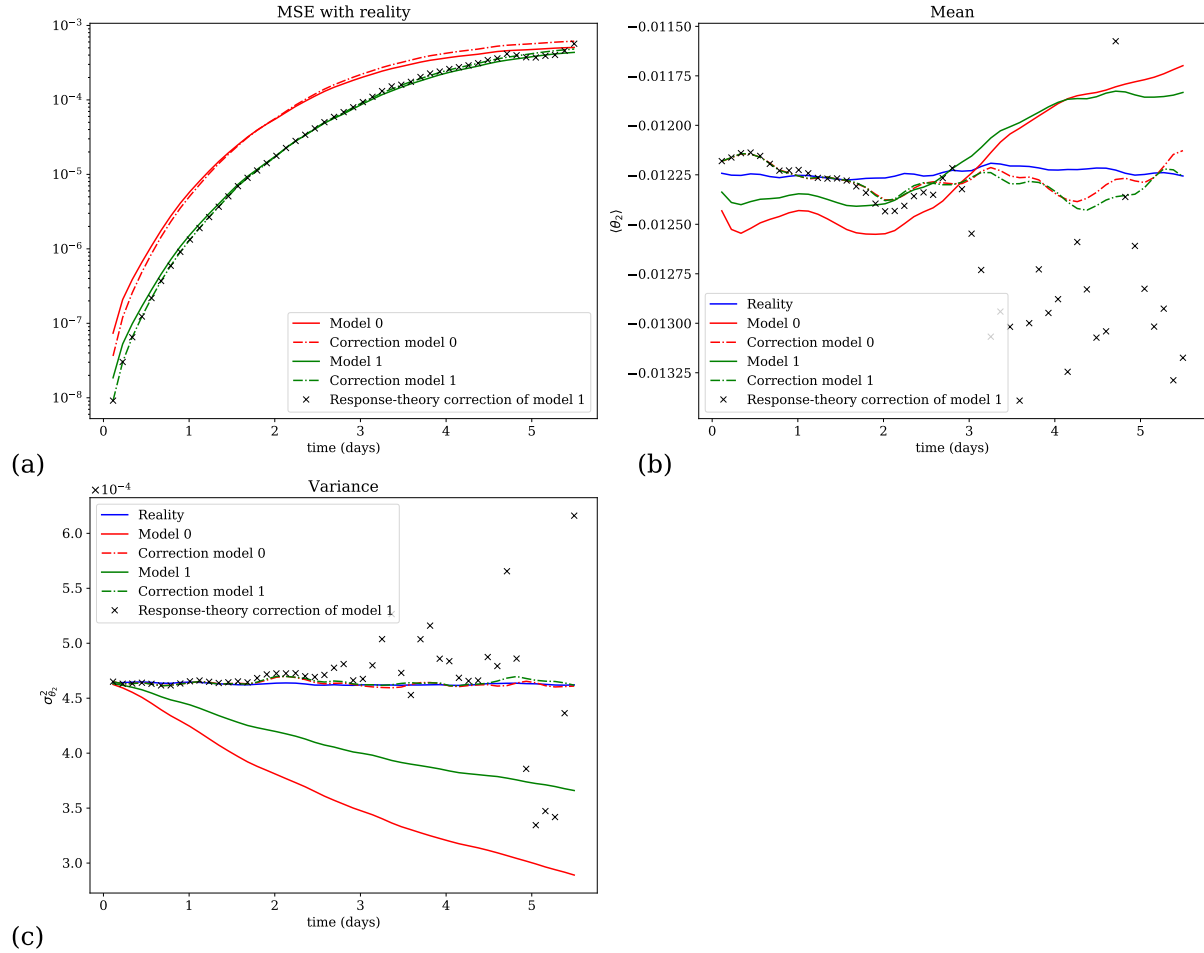


1.12 Variable θ_2

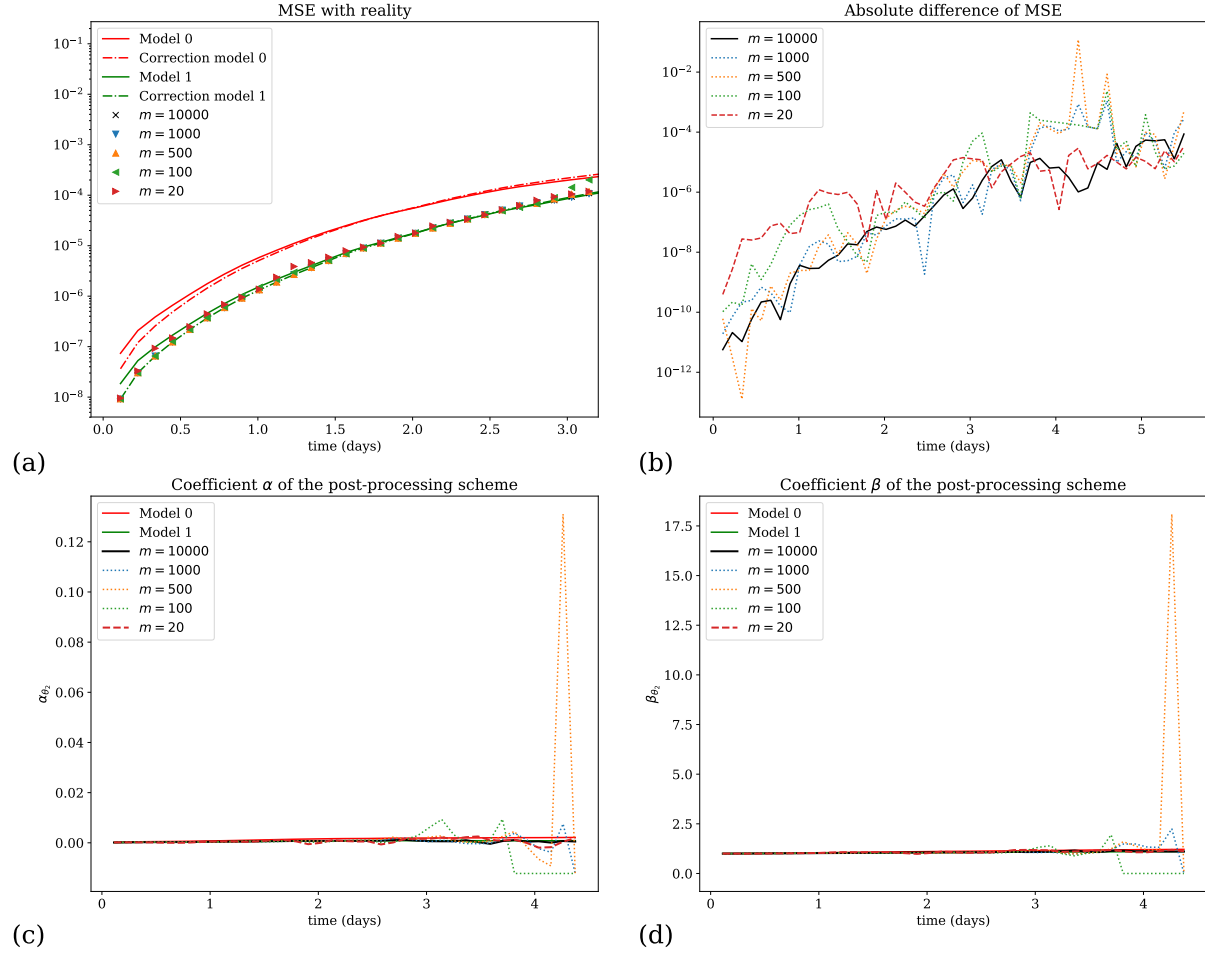
1.12.1 Corrections of the moments of the variable



1.12.2 Performance of the correction

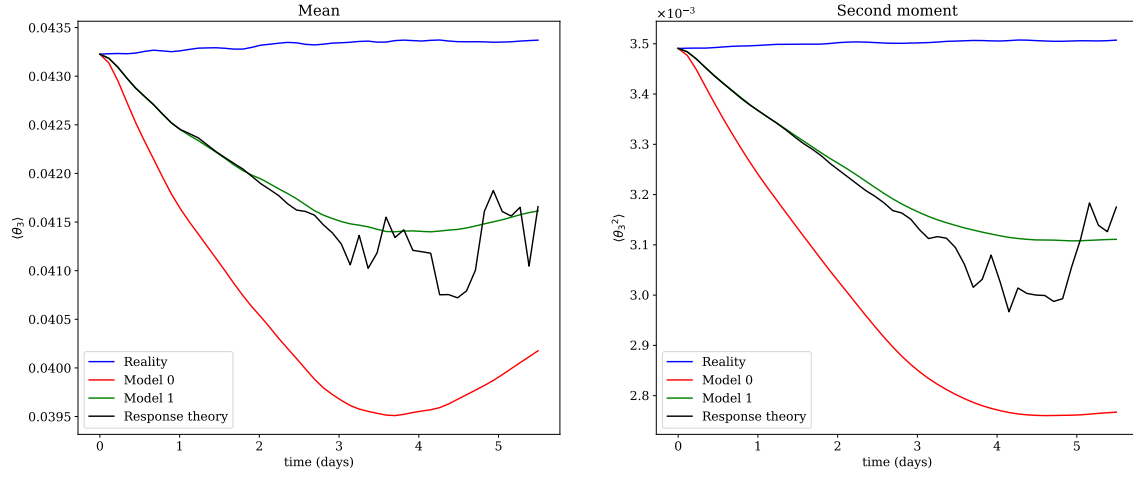


1.12.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

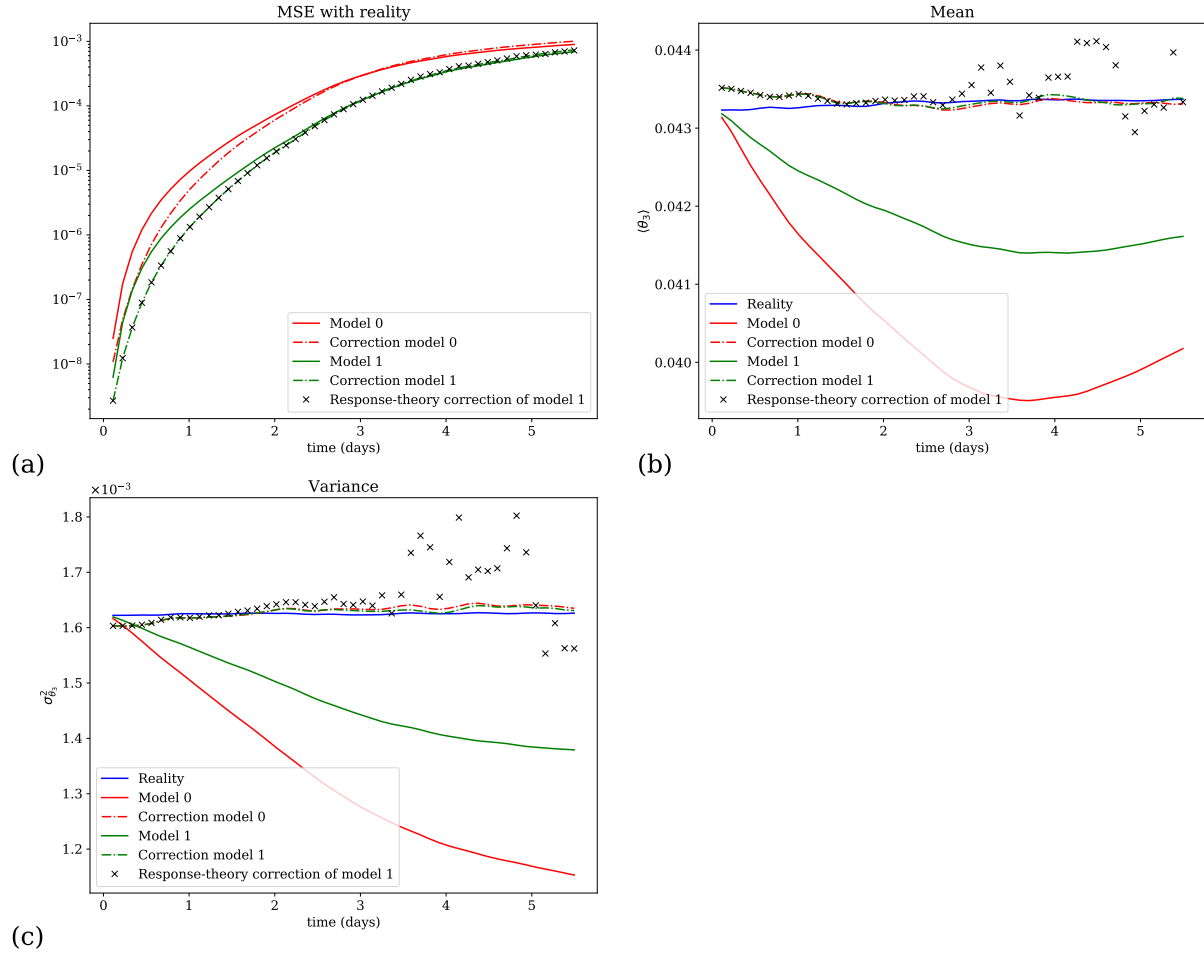


1.13 Variable θ_3

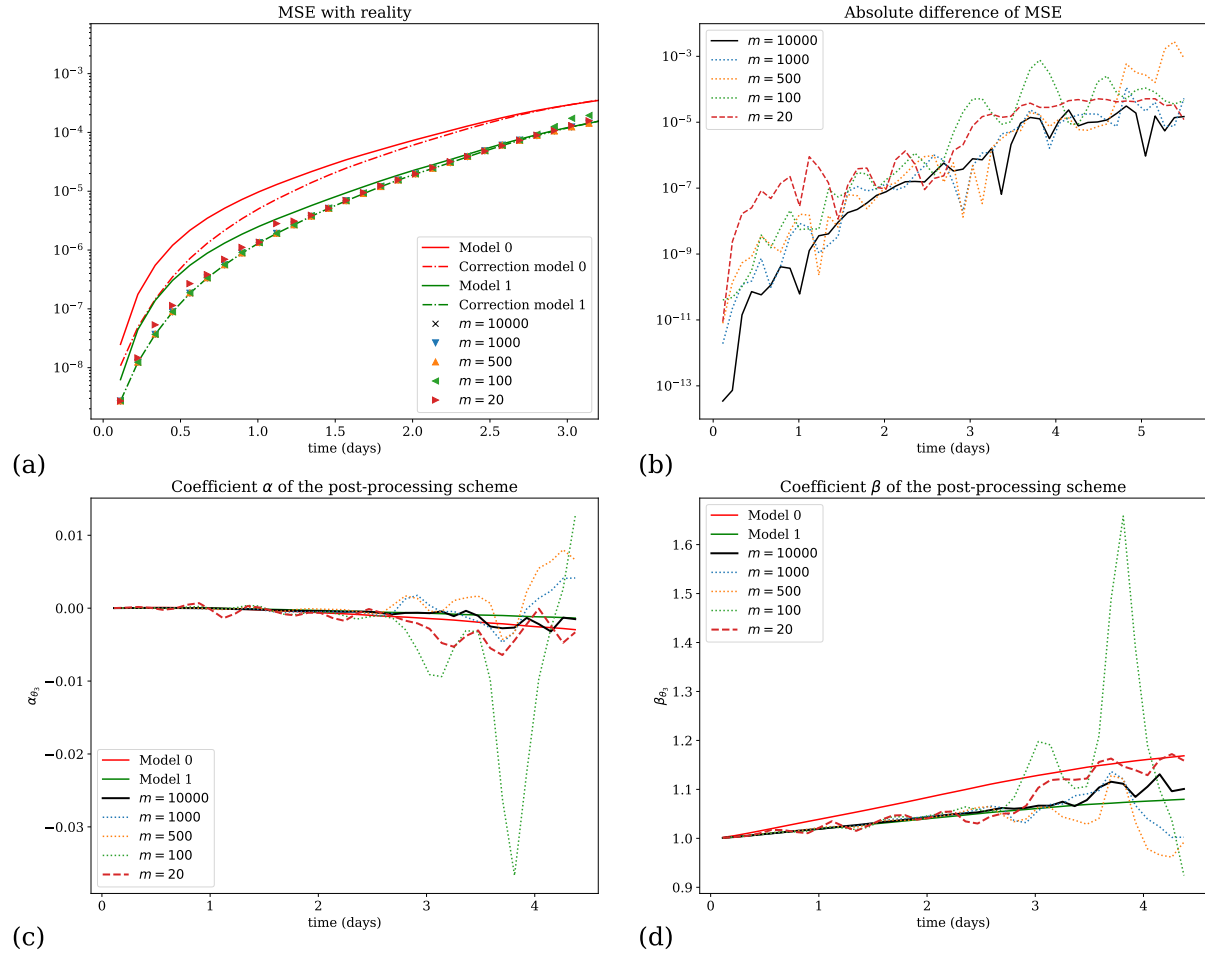
1.13.1 Corrections of the moments of the variable



1.13.2 Performance of the correction

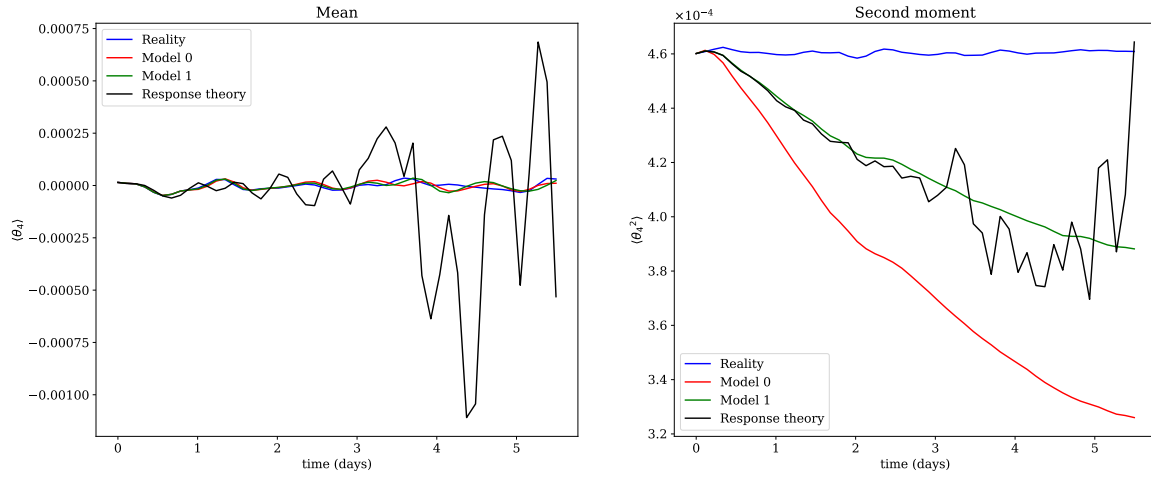


1.13.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

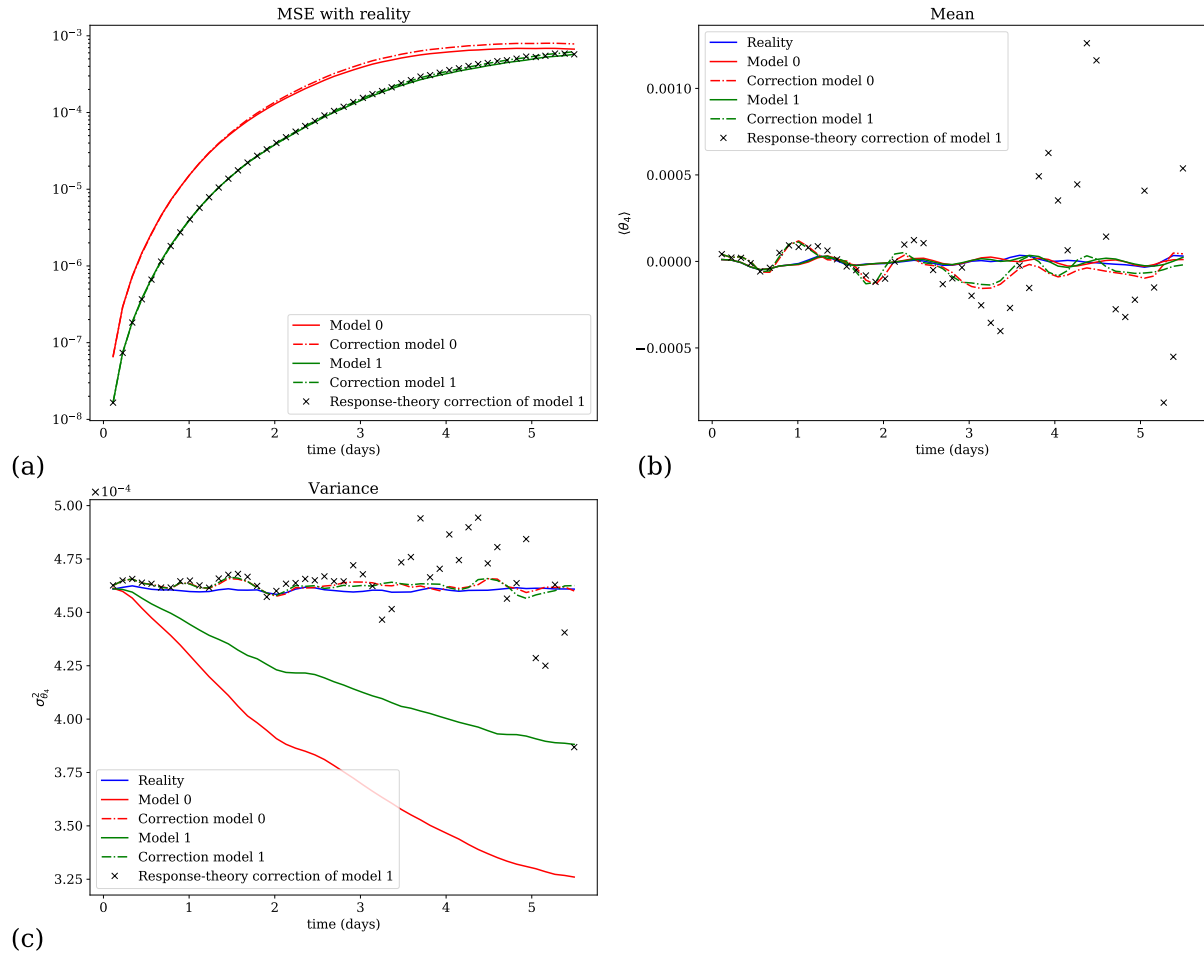


1.14 Variable θ_4

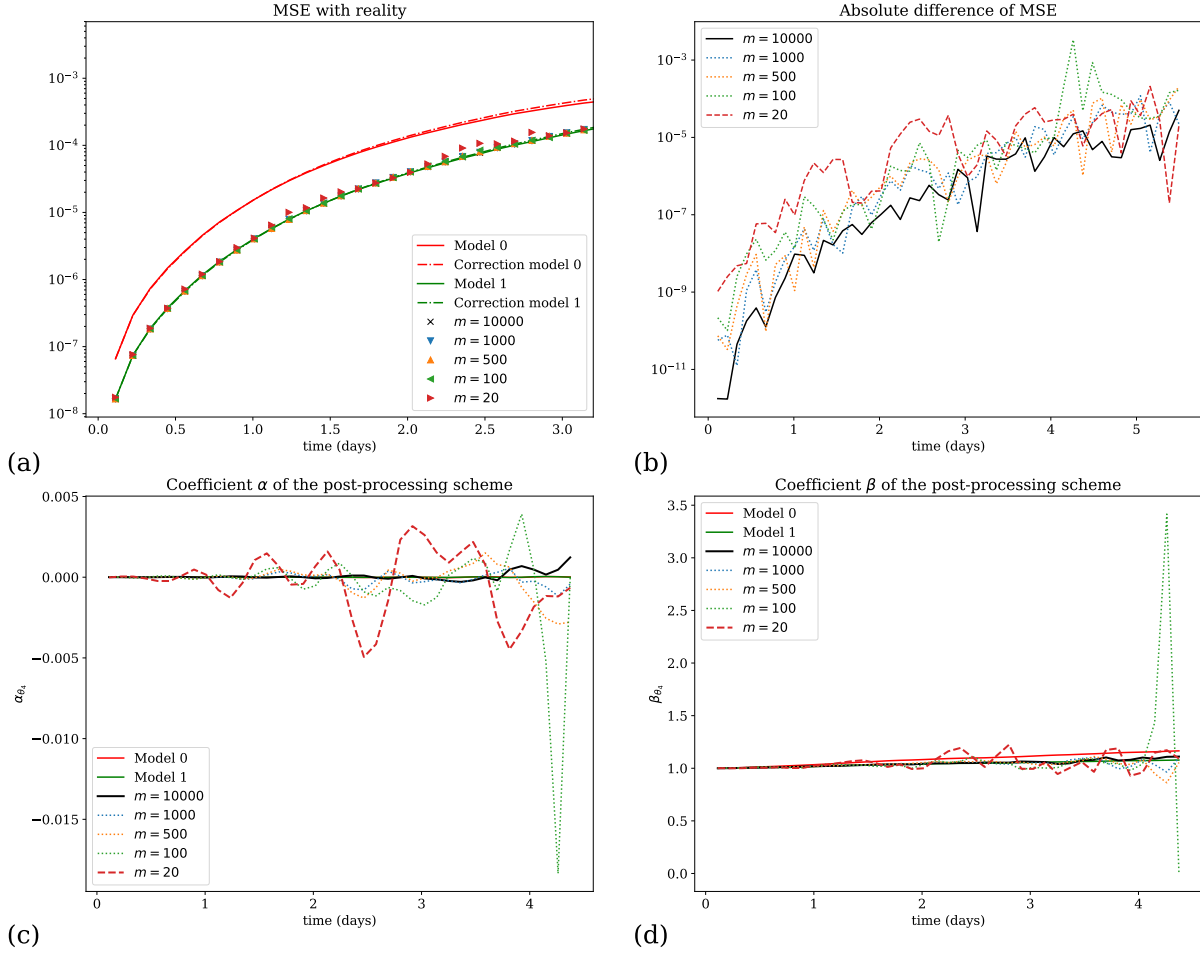
1.14.1 Corrections of the moments of the variable



1.14.2 Performance of the correction

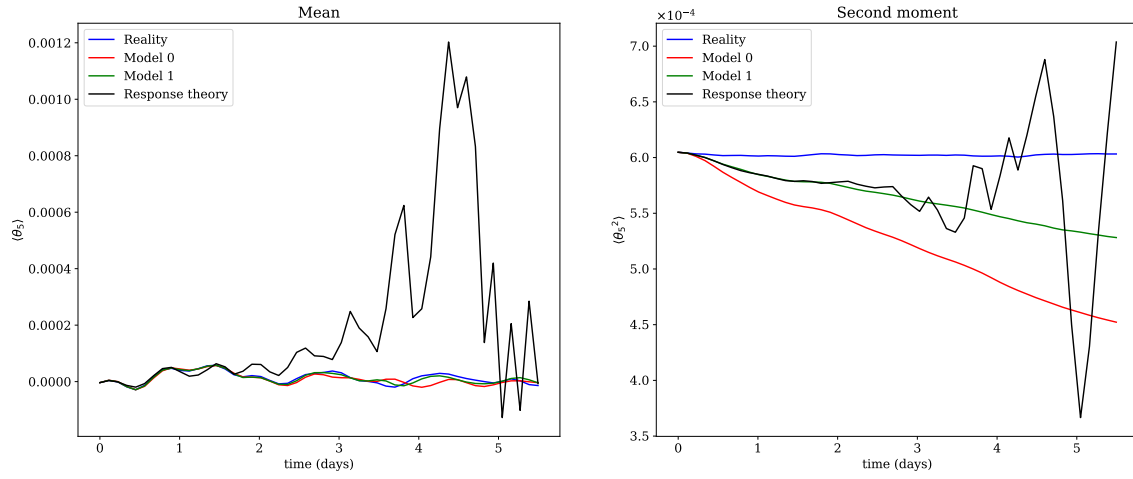


1.14.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

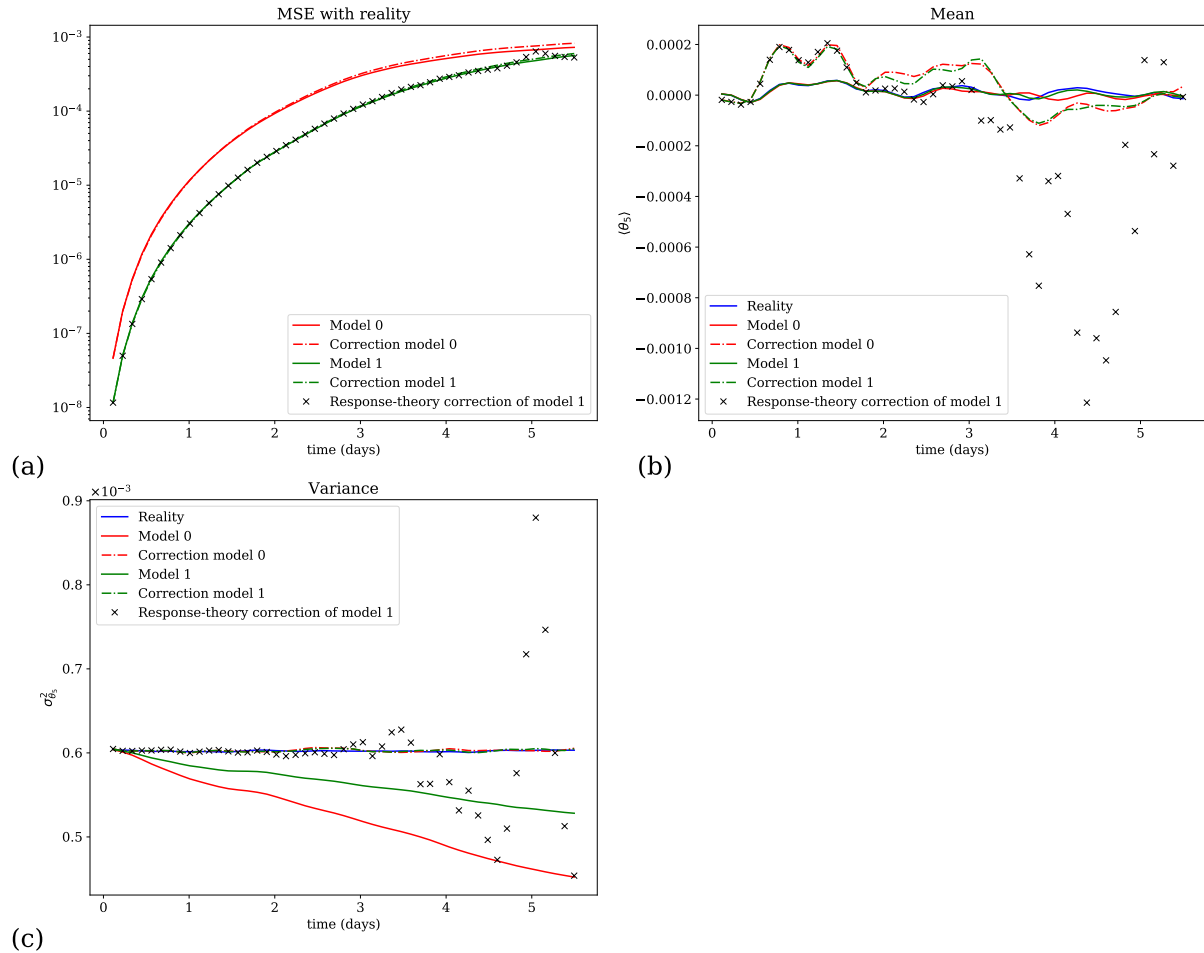


1.15 Variable θ_5

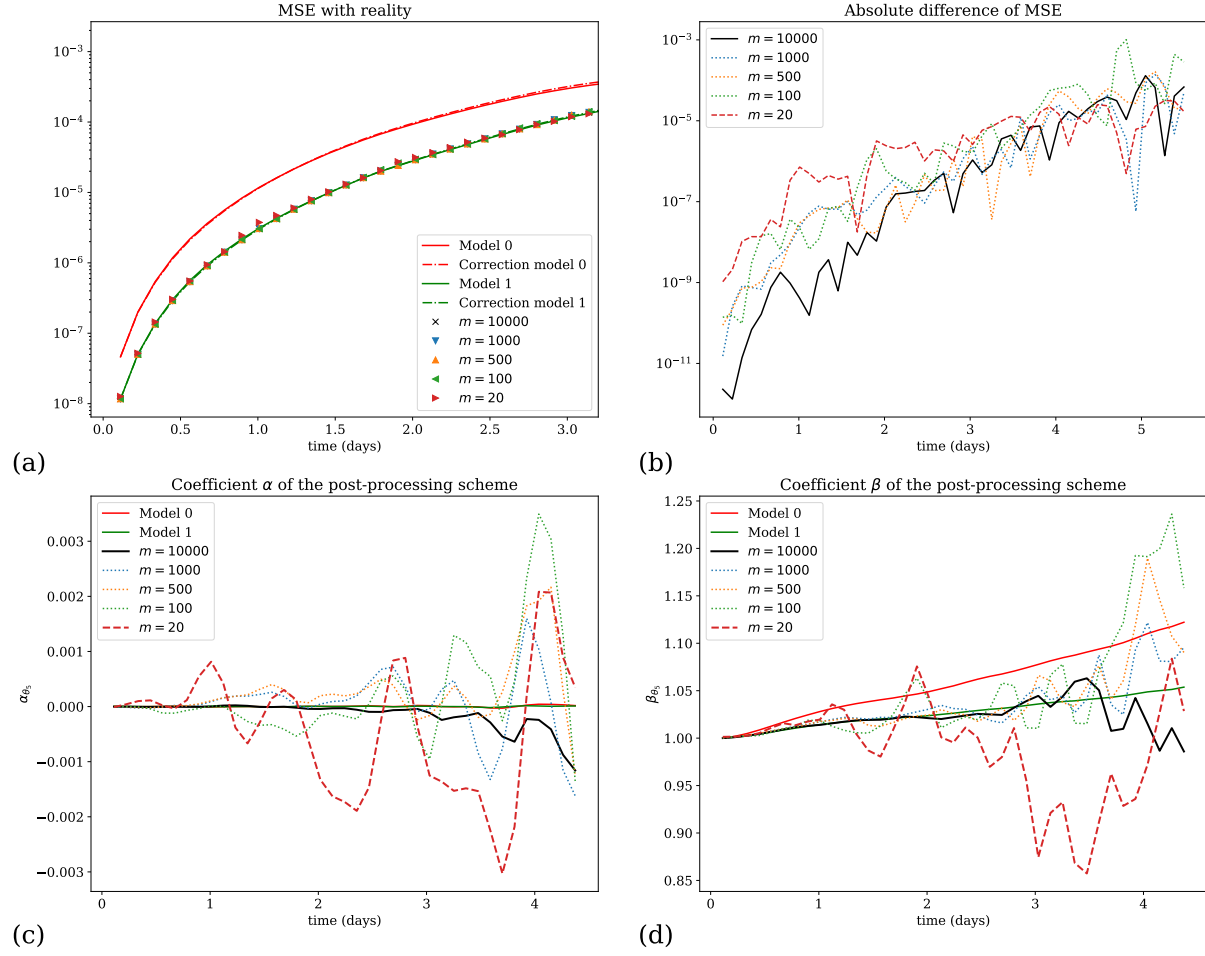
1.15.1 Corrections of the moments of the variable



1.15.2 Performance of the correction

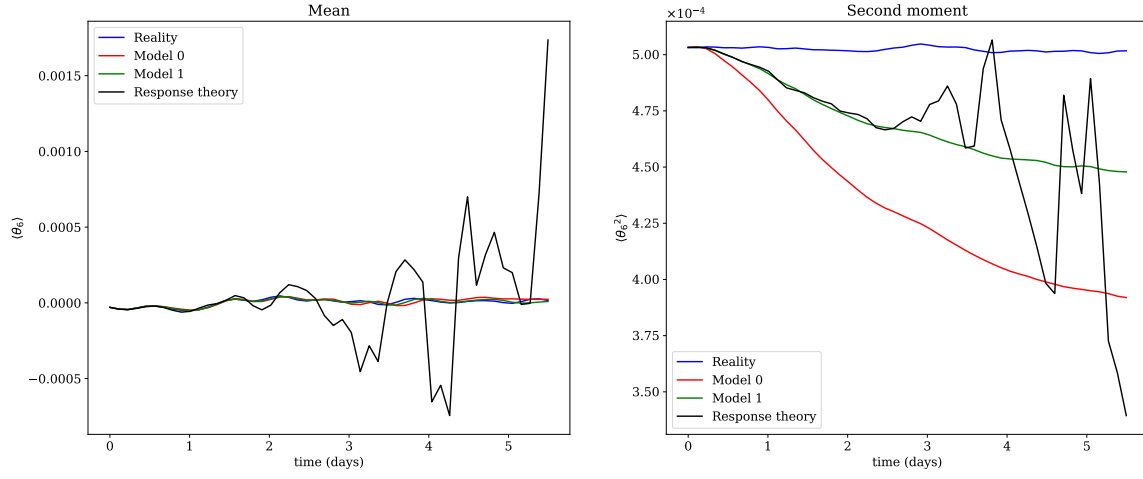


1.15.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

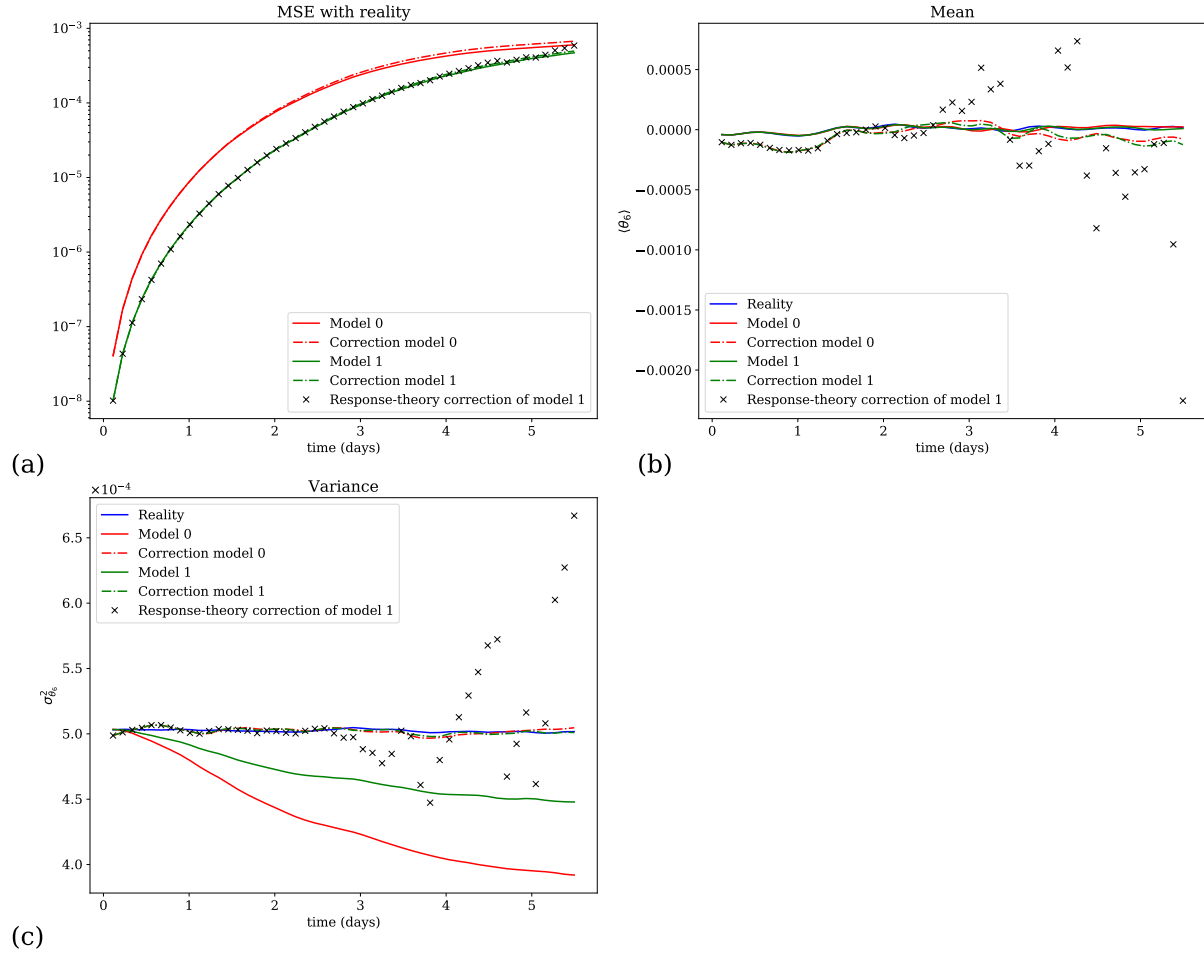


1.16 Variable θ_6

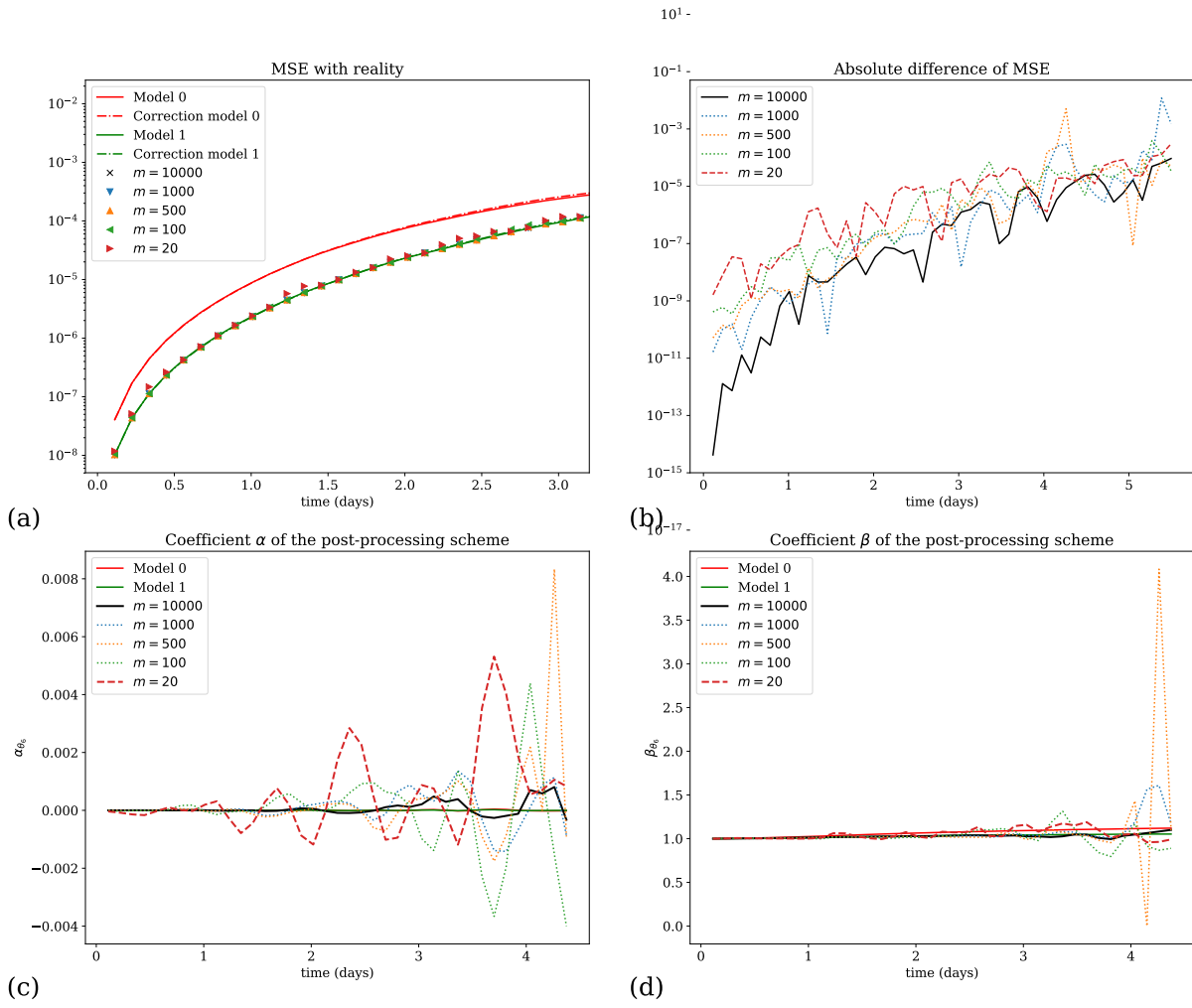
1.16.1 Corrections of the moments of the variable



1.16.2 Performance of the correction

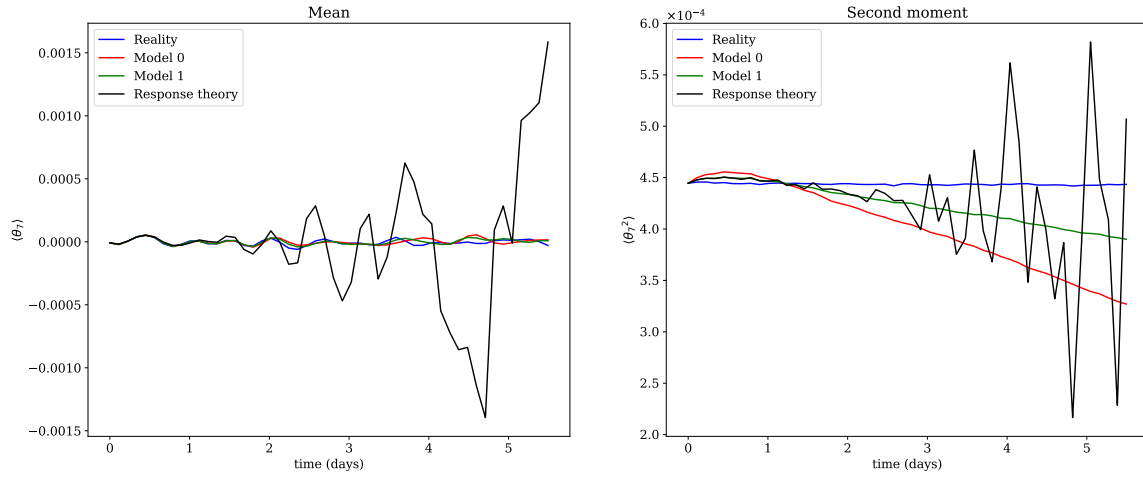


1.16.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

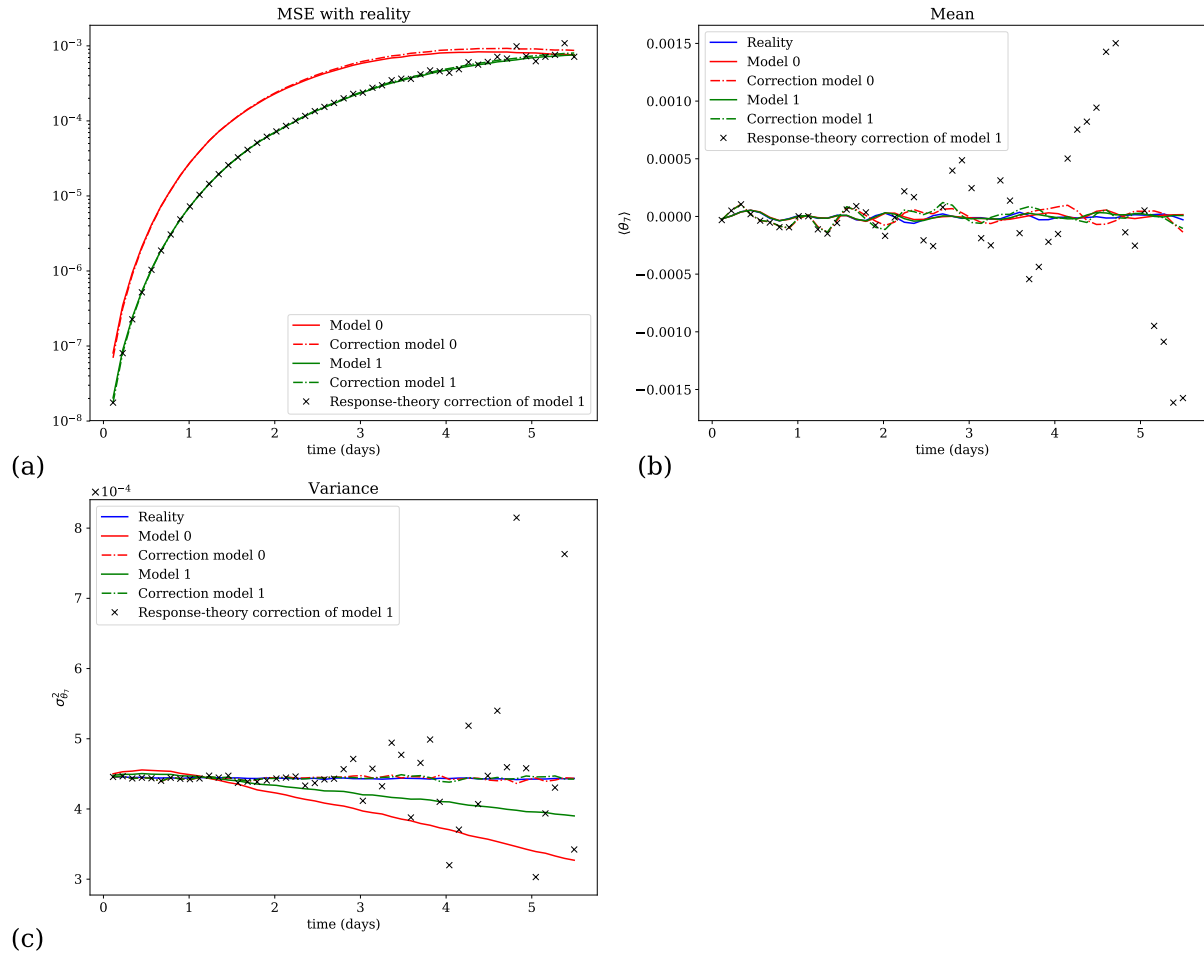


1.17 Variable θ_7

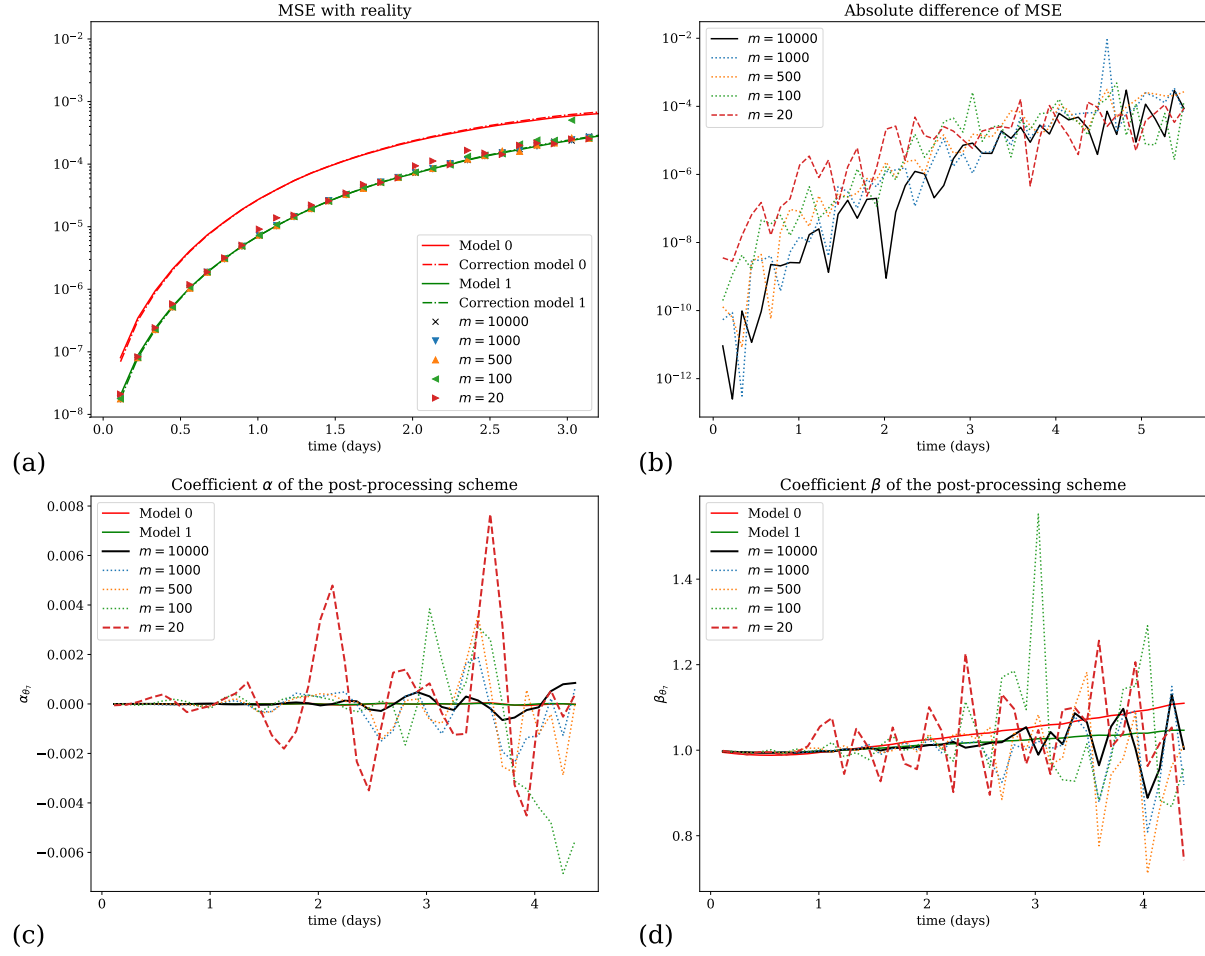
1.17.1 Corrections of the moments of the variable



1.17.2 Performance of the correction

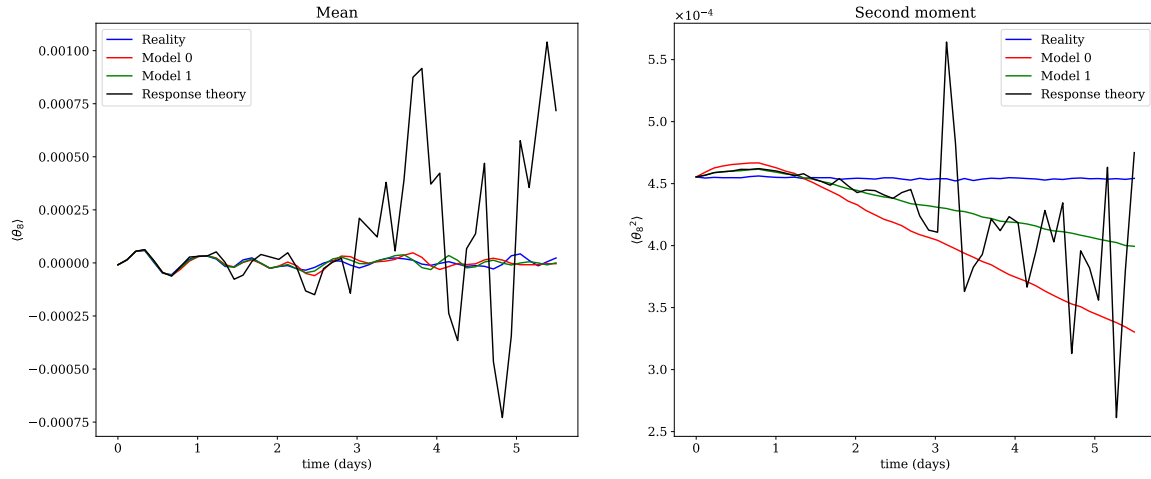


1.17.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

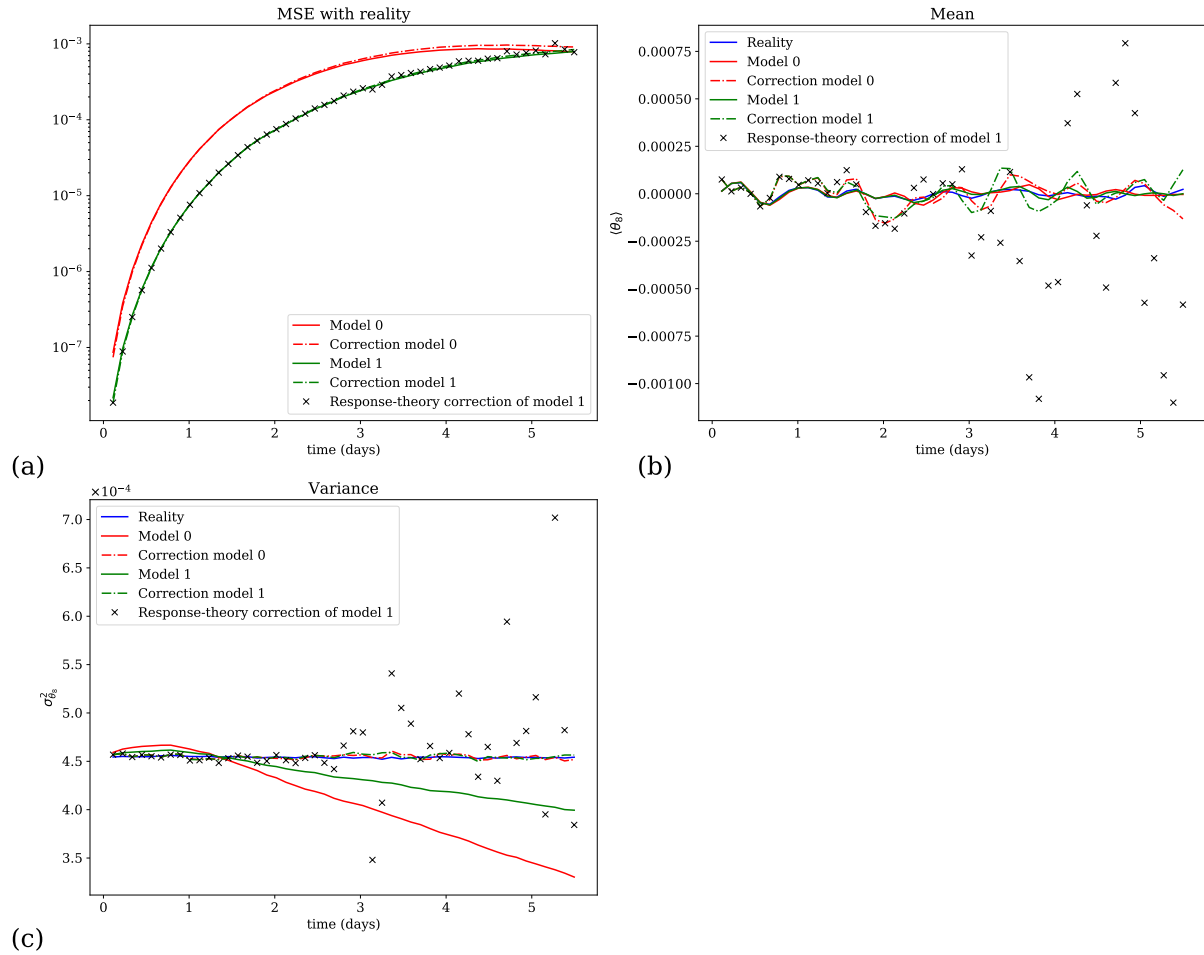


1.18 Variable θ_8

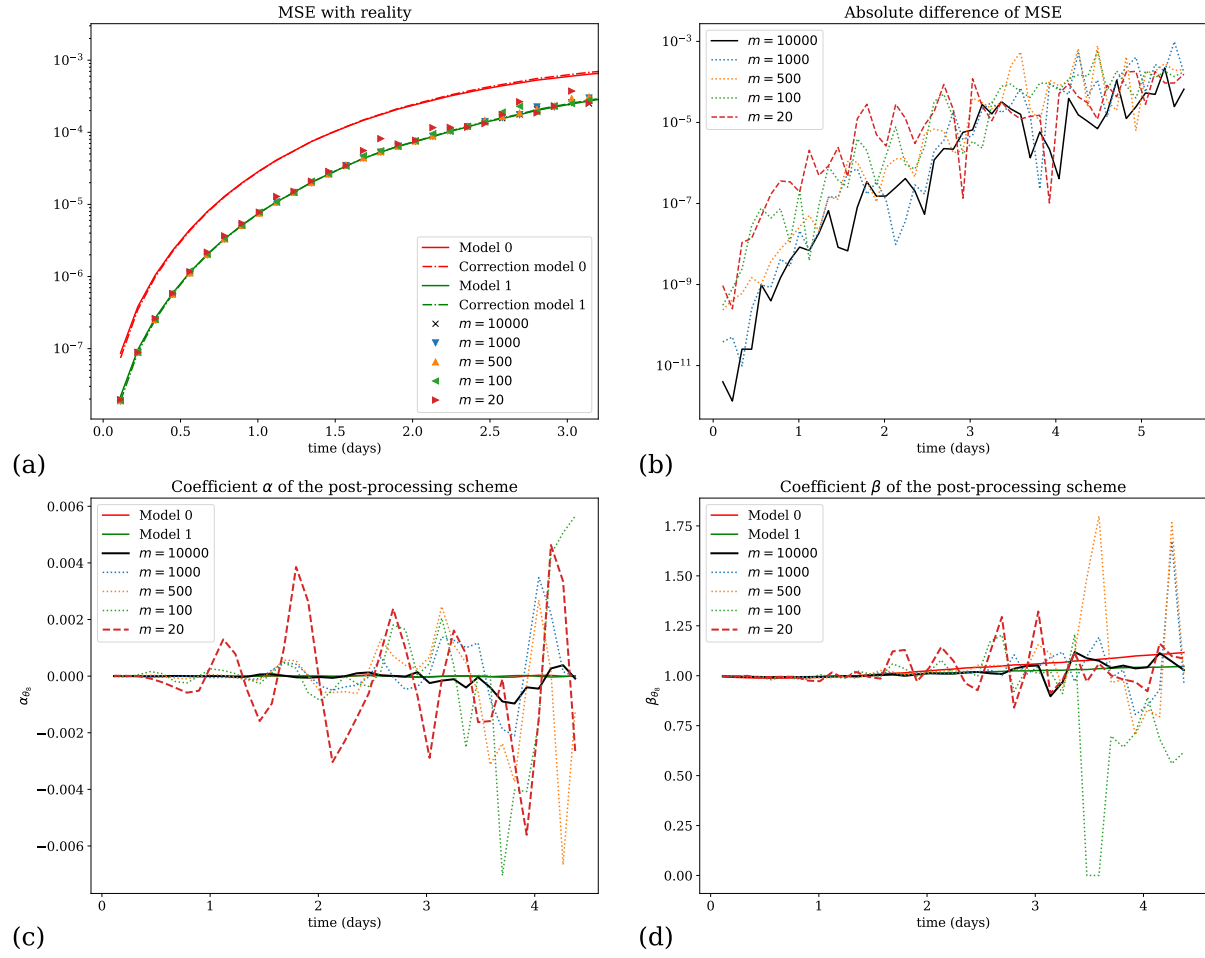
1.18.1 Corrections of the moments of the variable



1.18.2 Performance of the correction

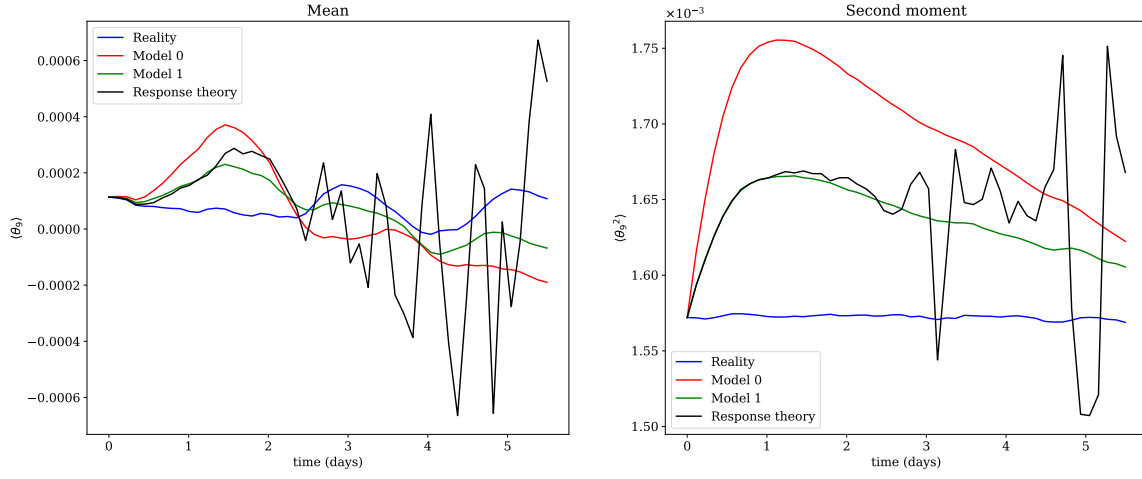


1.18.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

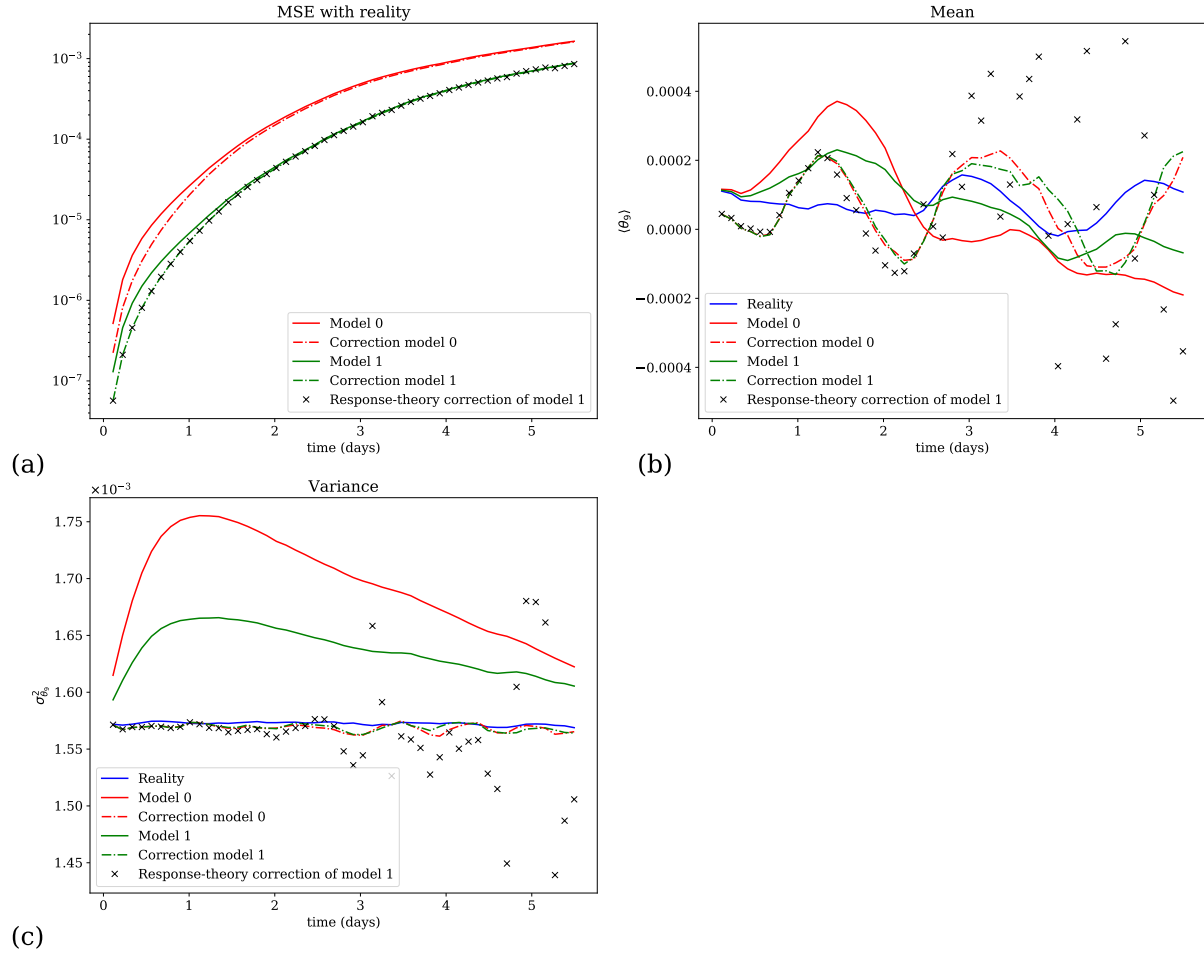


1.19 Variable θ_9

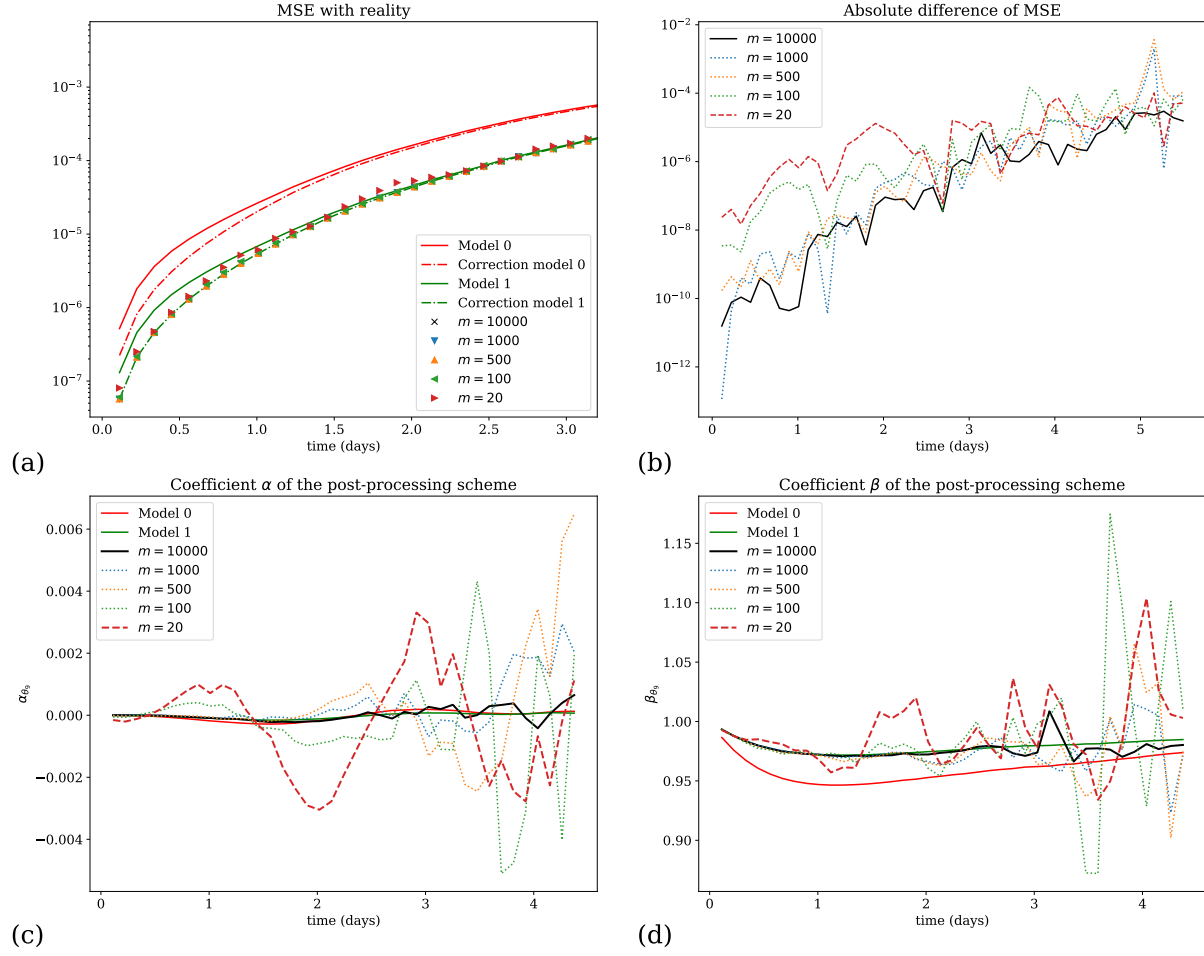
1.19.1 Corrections of the moments of the variable



1.19.2 Performance of the correction

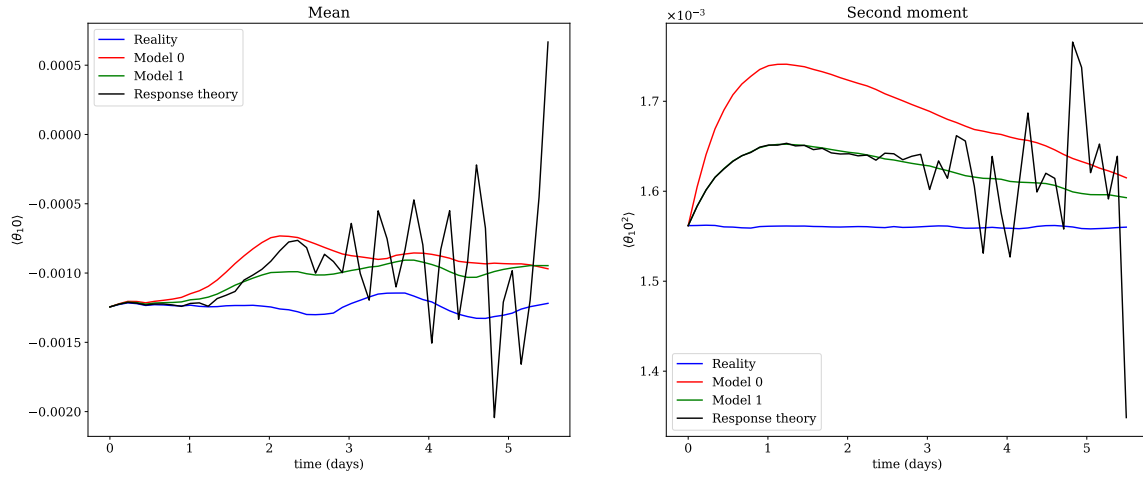


1.19.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

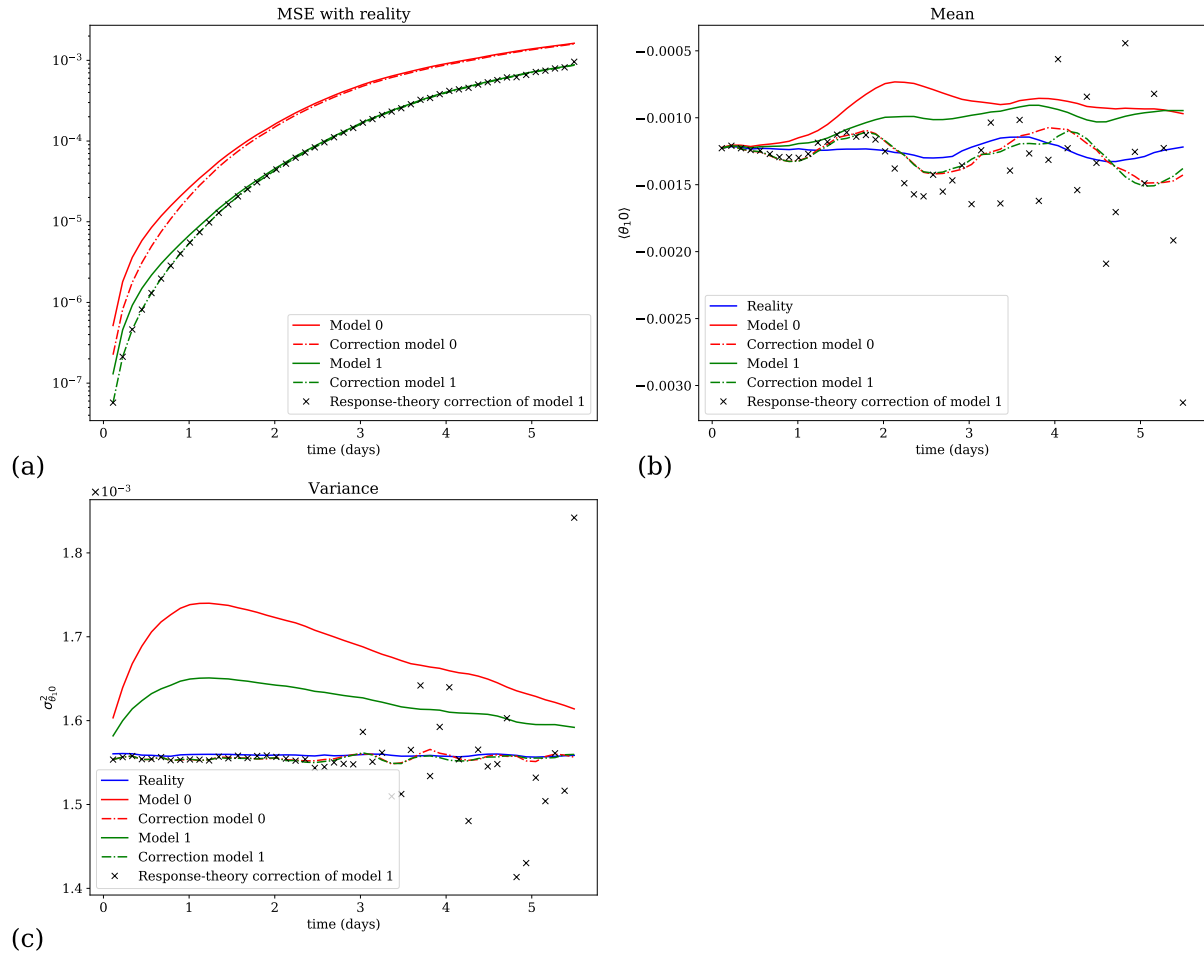


1.20 Variable θ_{10}

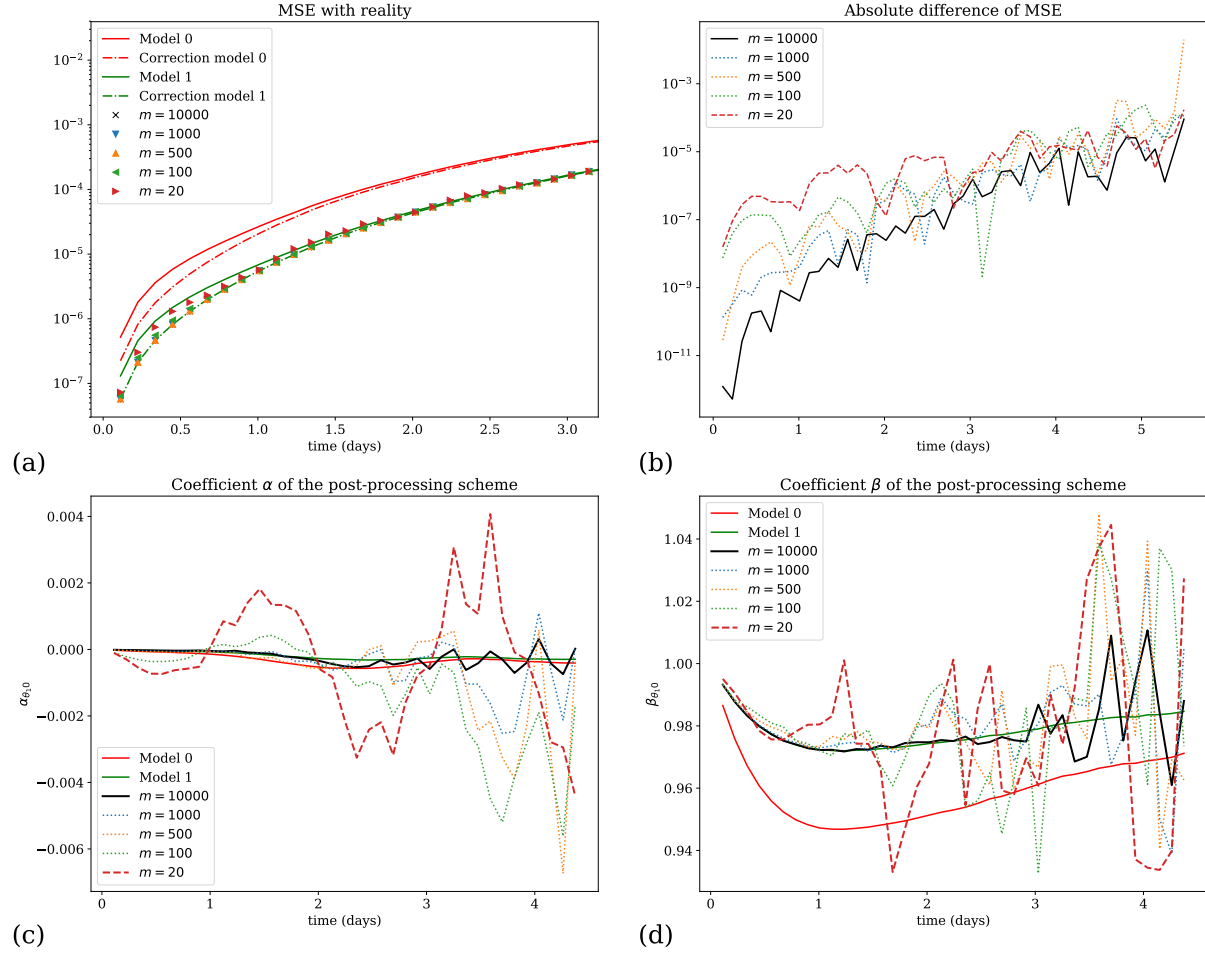
1.20.1 Corrections of the moments of the variable



1.20.2 Performance of the correction



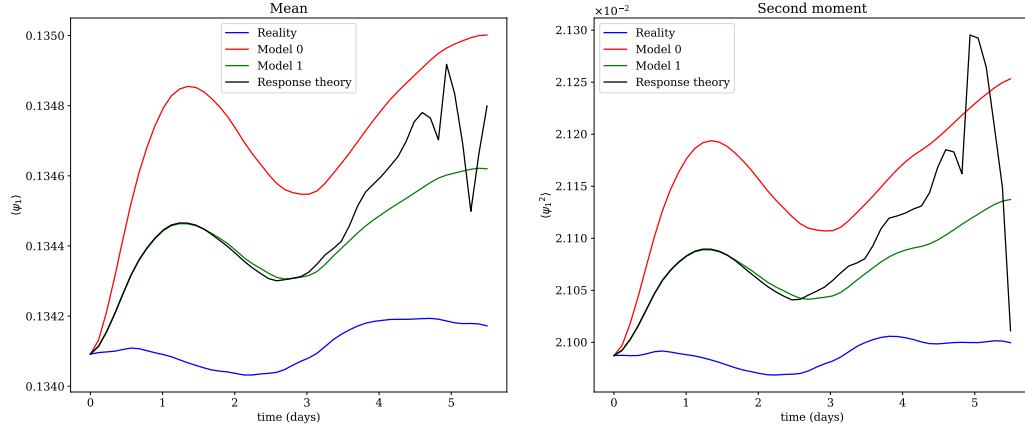
1.20.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories



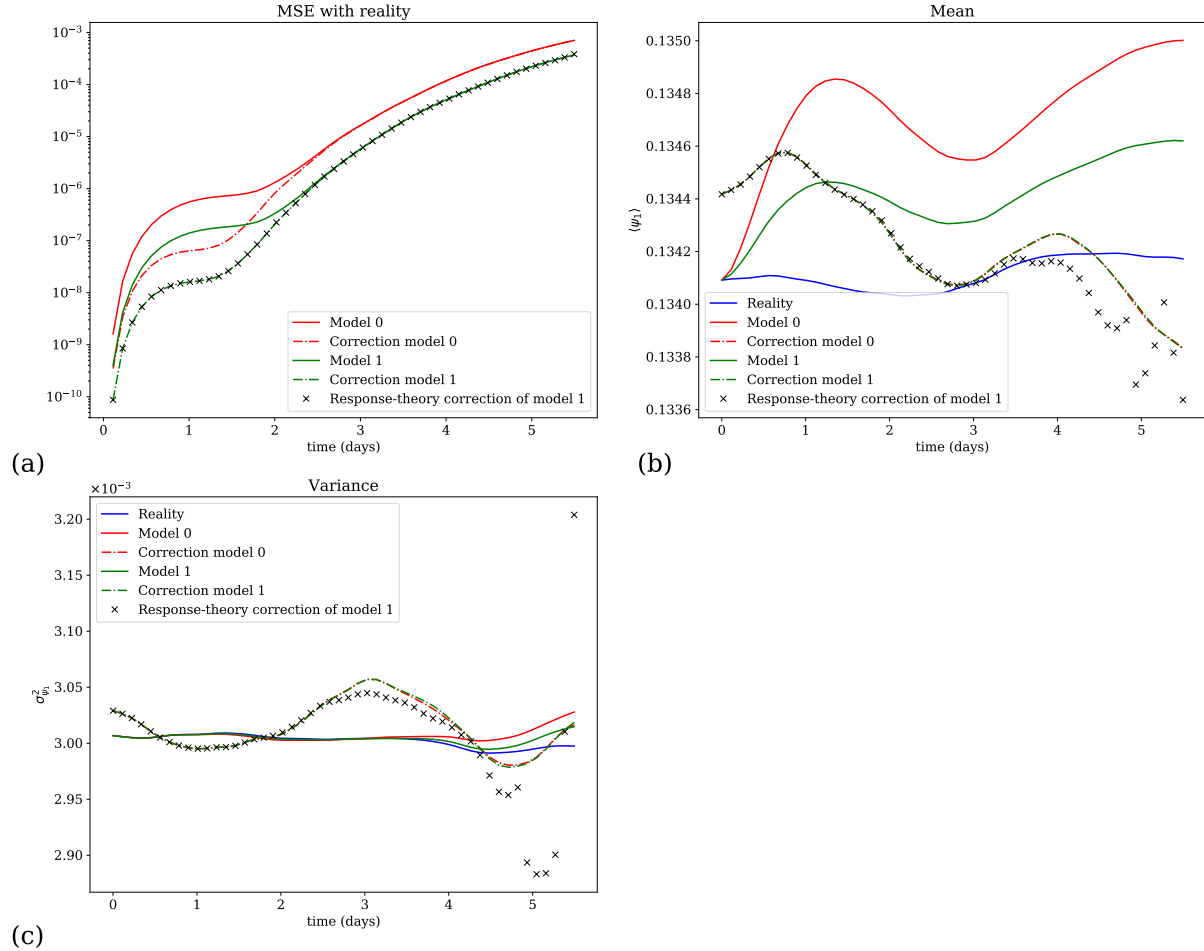
2 Experiment varying the Newtonian cooling coefficient

2.1 Variable ψ_1

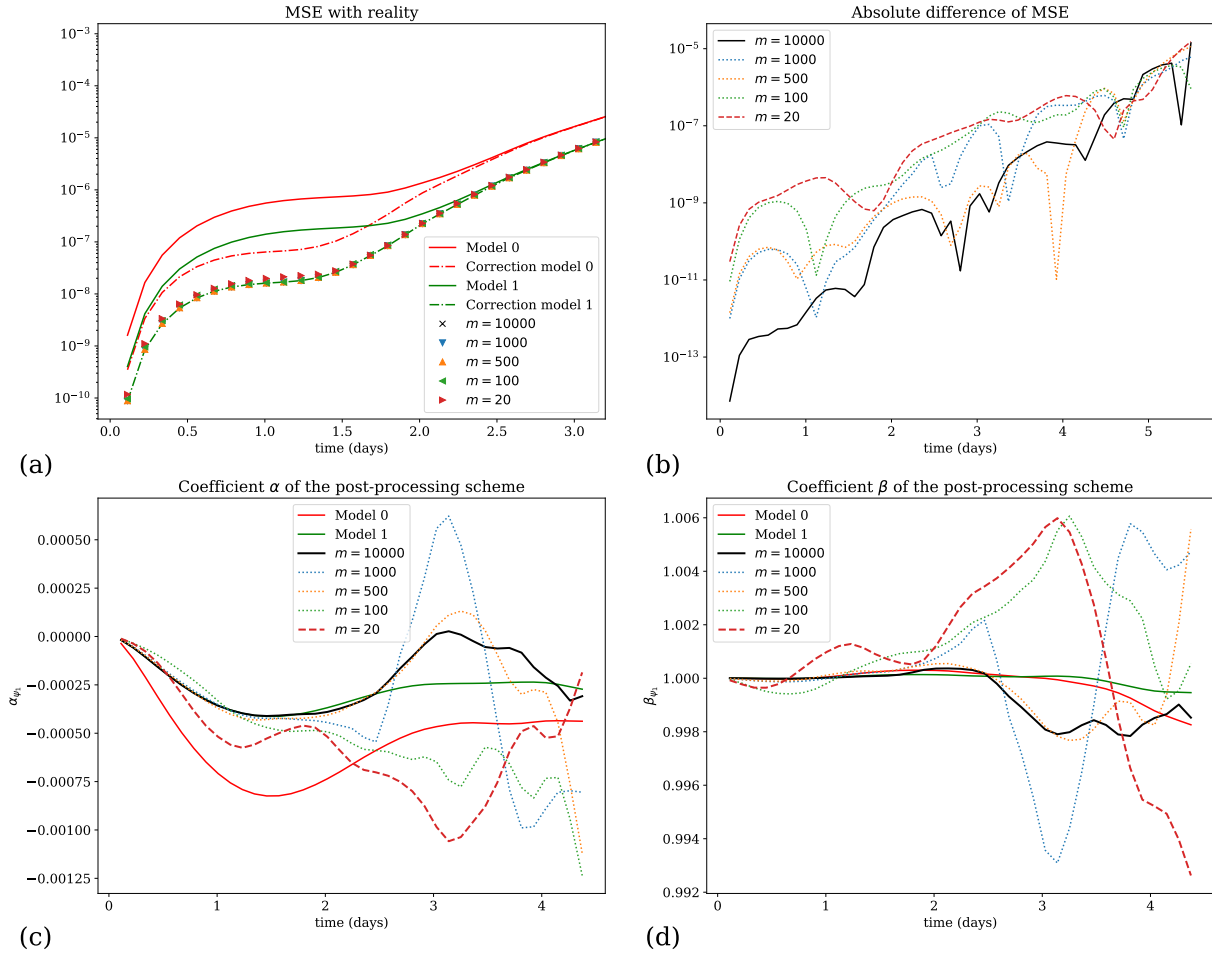
2.1.1 Corrections of the moments of the variable



2.1.2 Performance of the correction

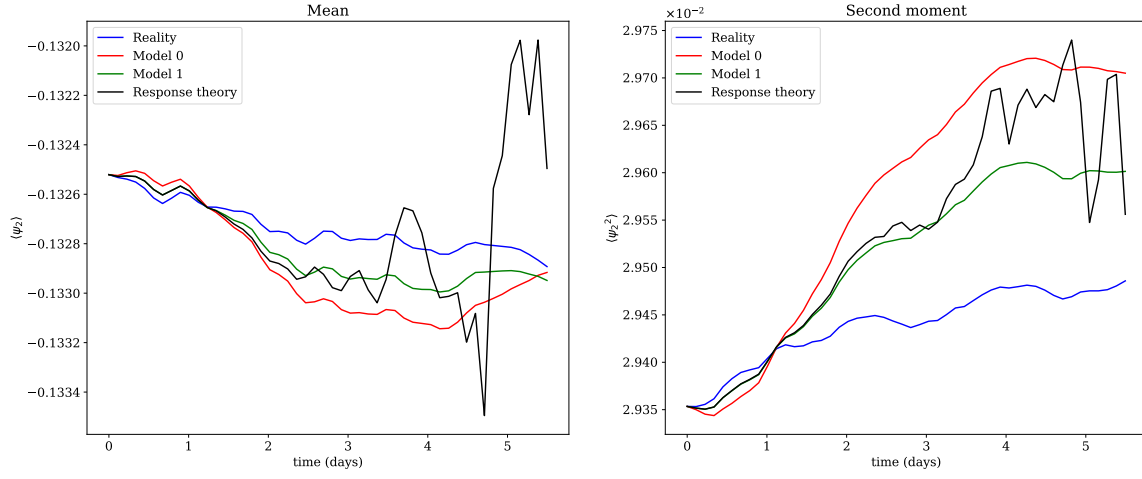


2.1.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

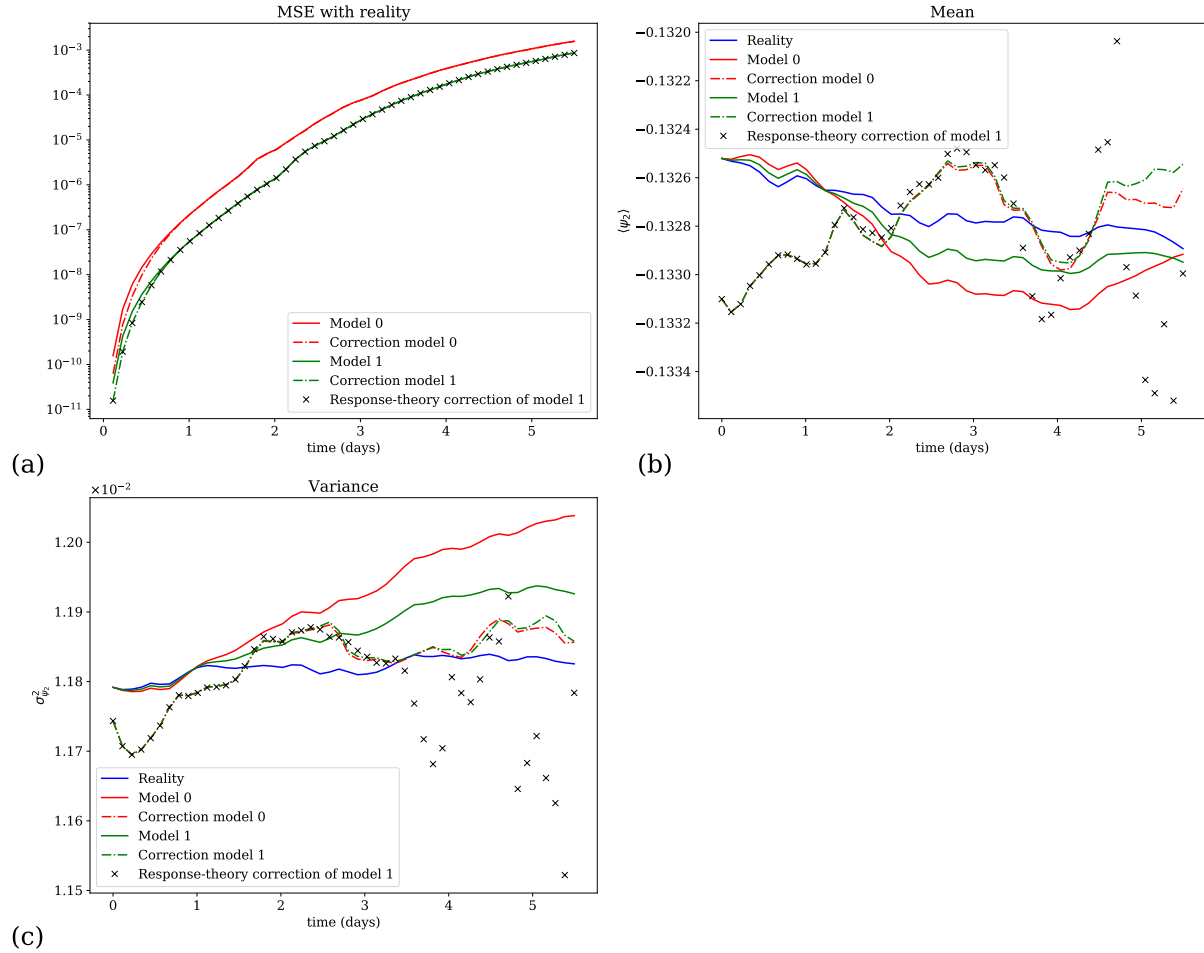


2.2 Variable ψ_2

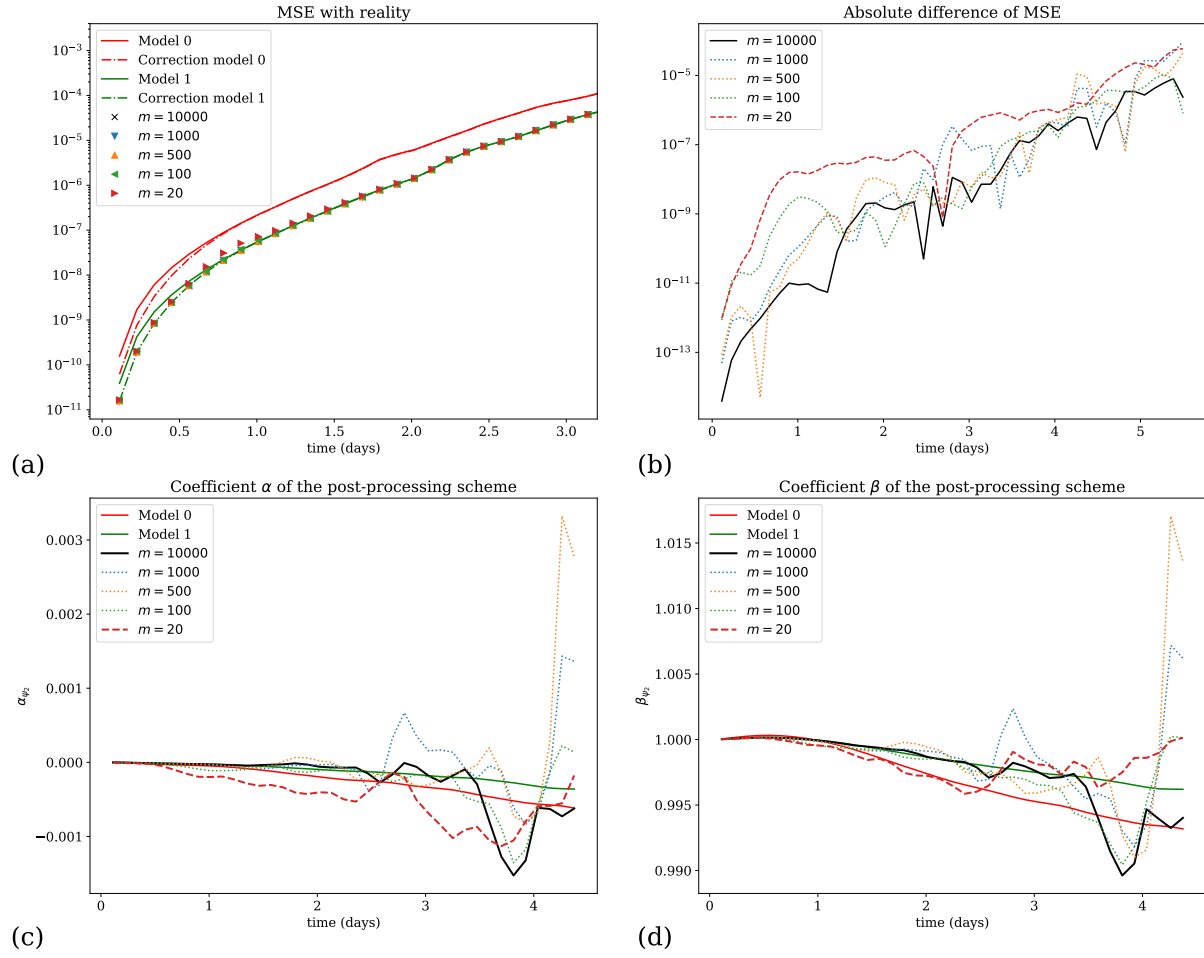
2.2.1 Corrections of the moments of the variable



2.2.2 Performance of the correction

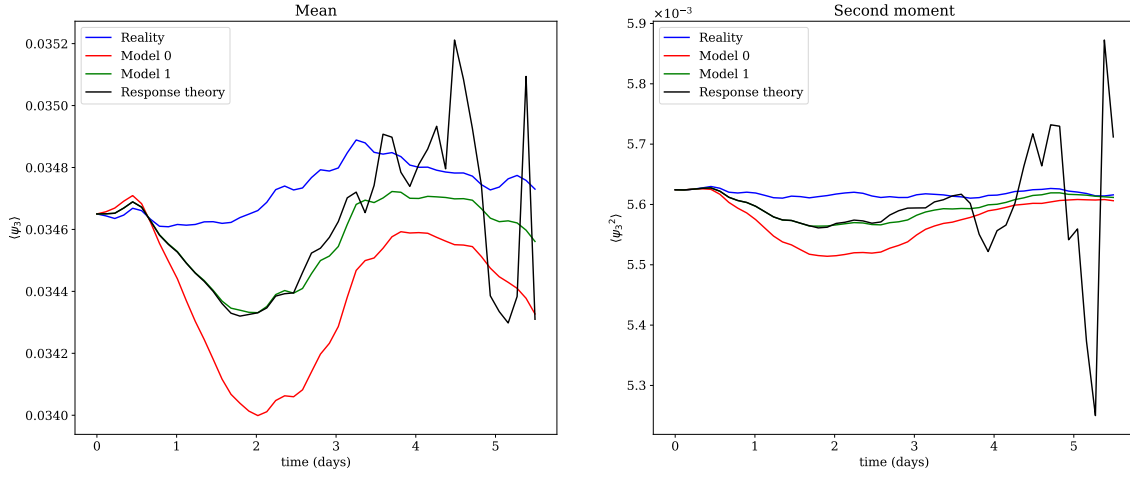


2.2.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

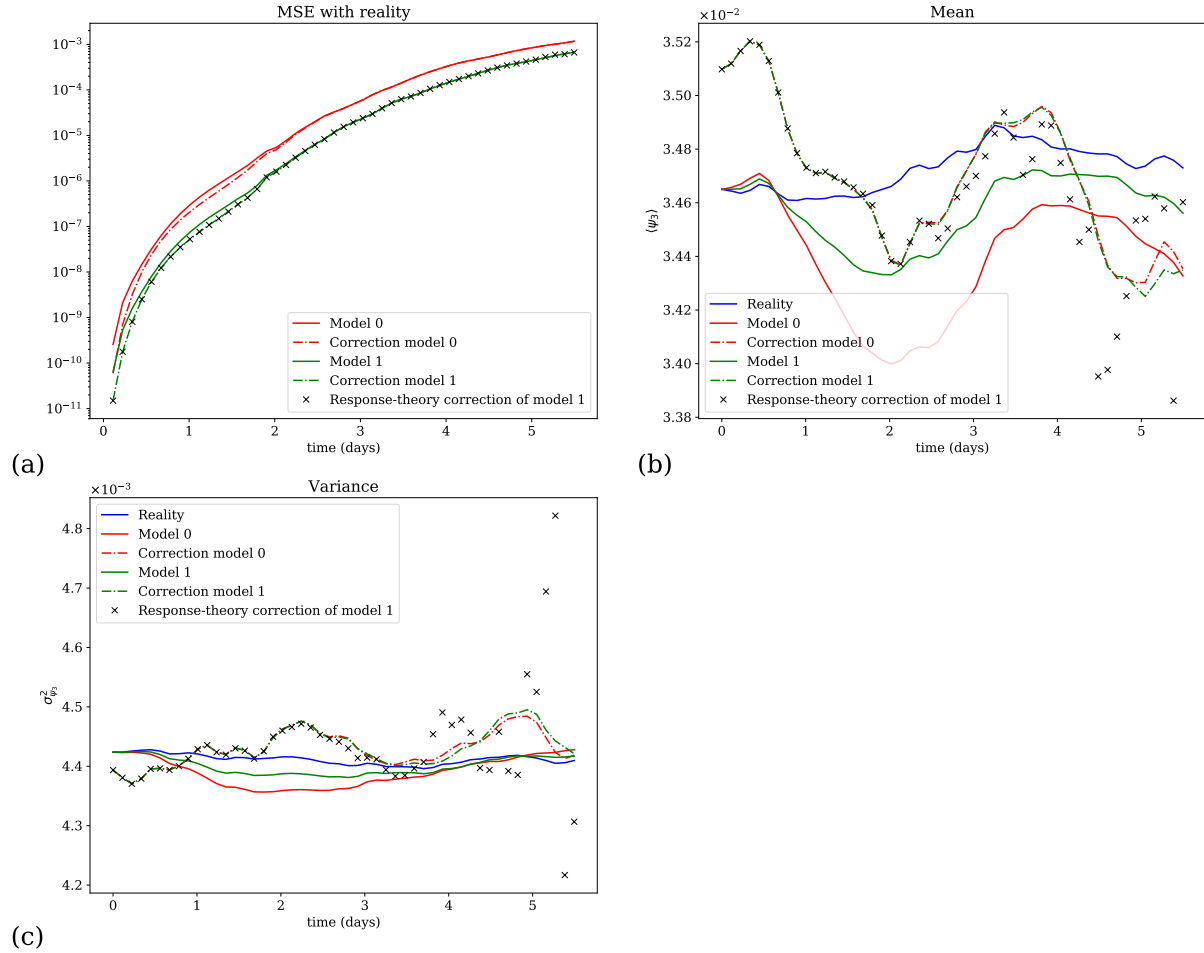


2.3 Variable ψ_3

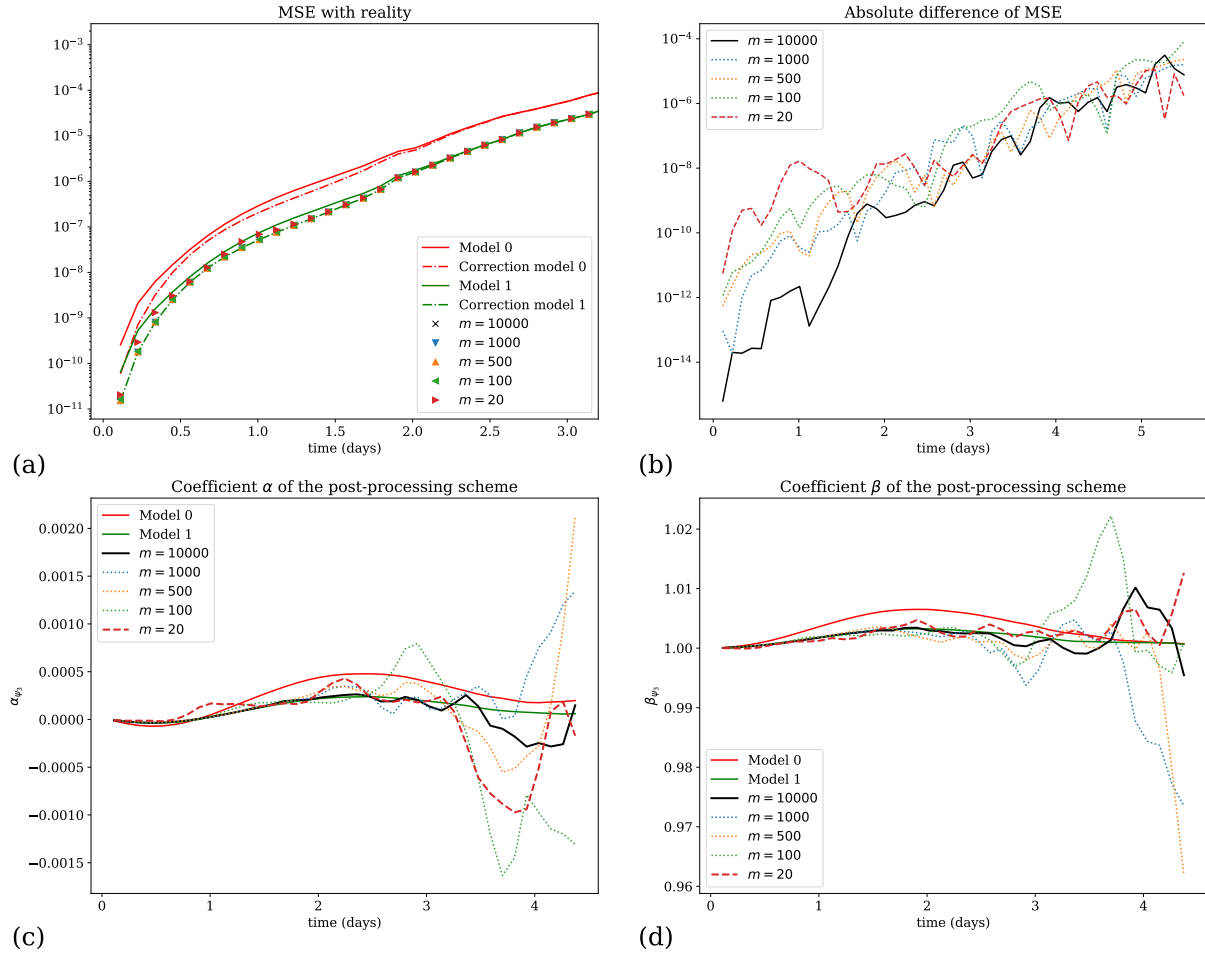
2.3.1 Corrections of the moments of the variable



2.3.2 Performance of the correction

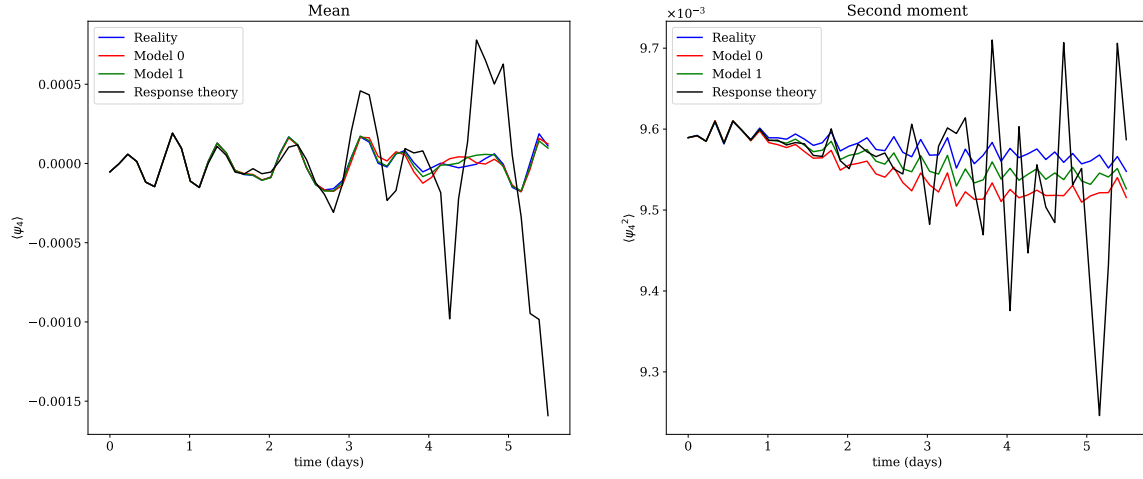


2.3.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

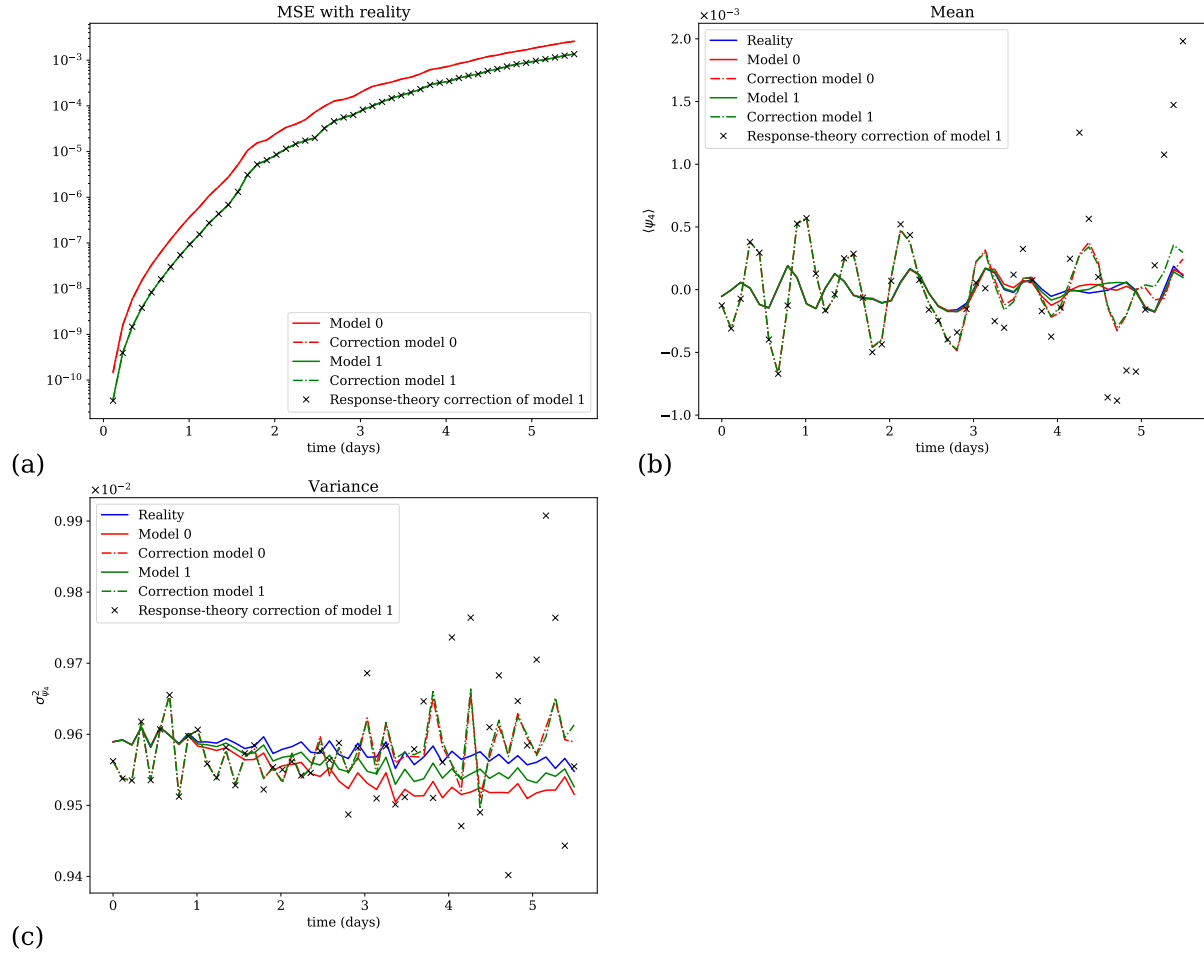


2.4 Variable ψ_4

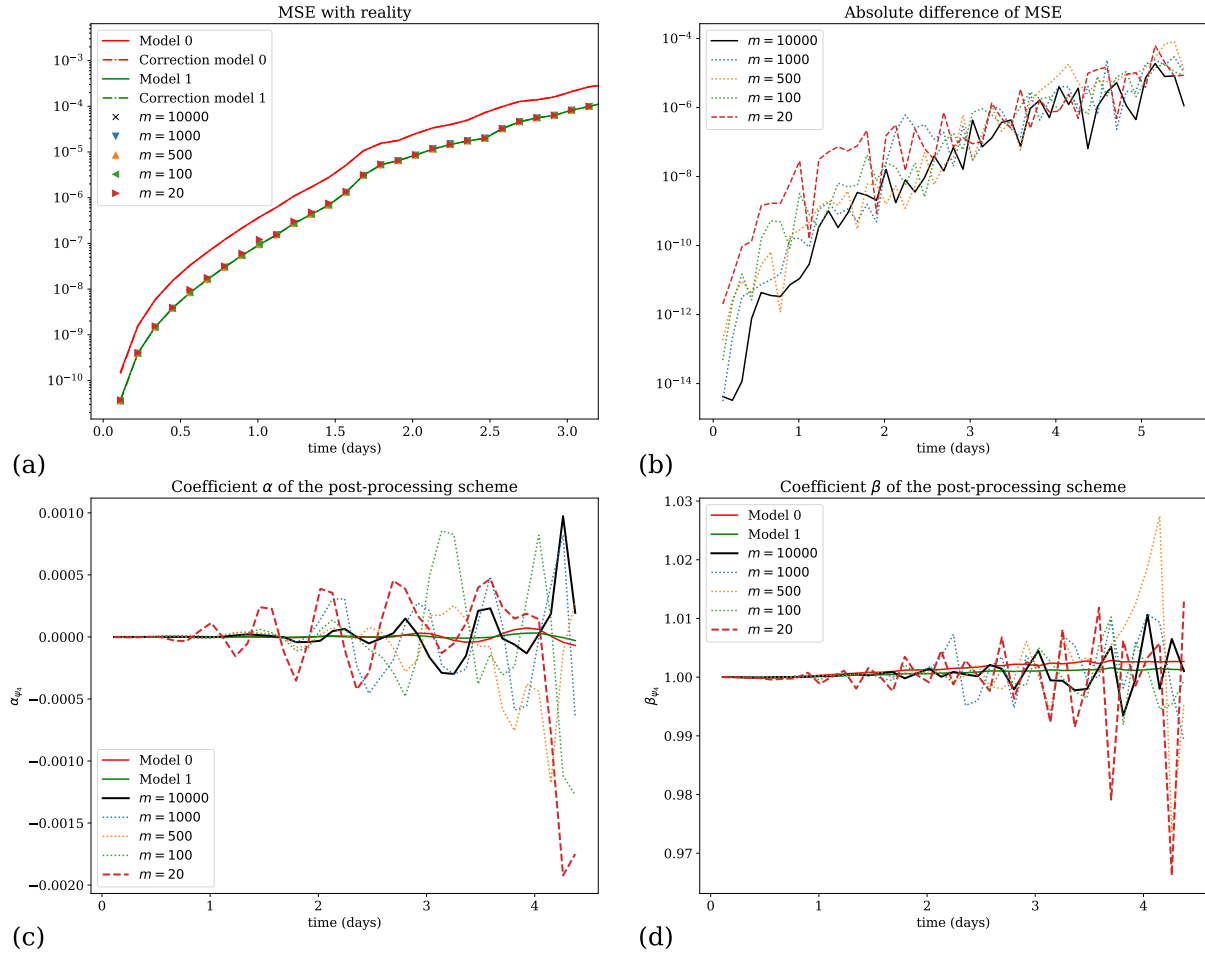
2.4.1 Corrections of the moments of the variable



2.4.2 Performance of the correction

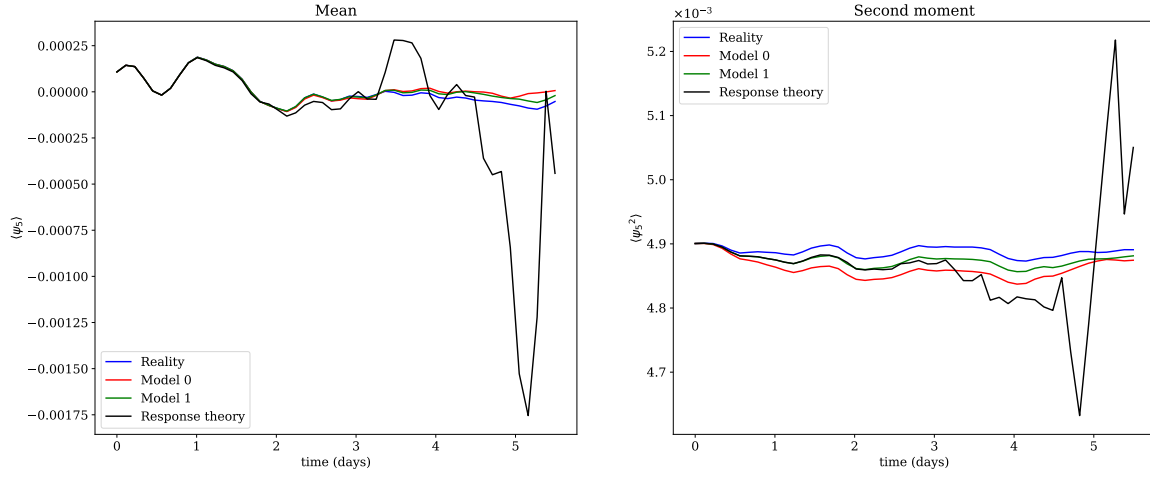


2.4.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

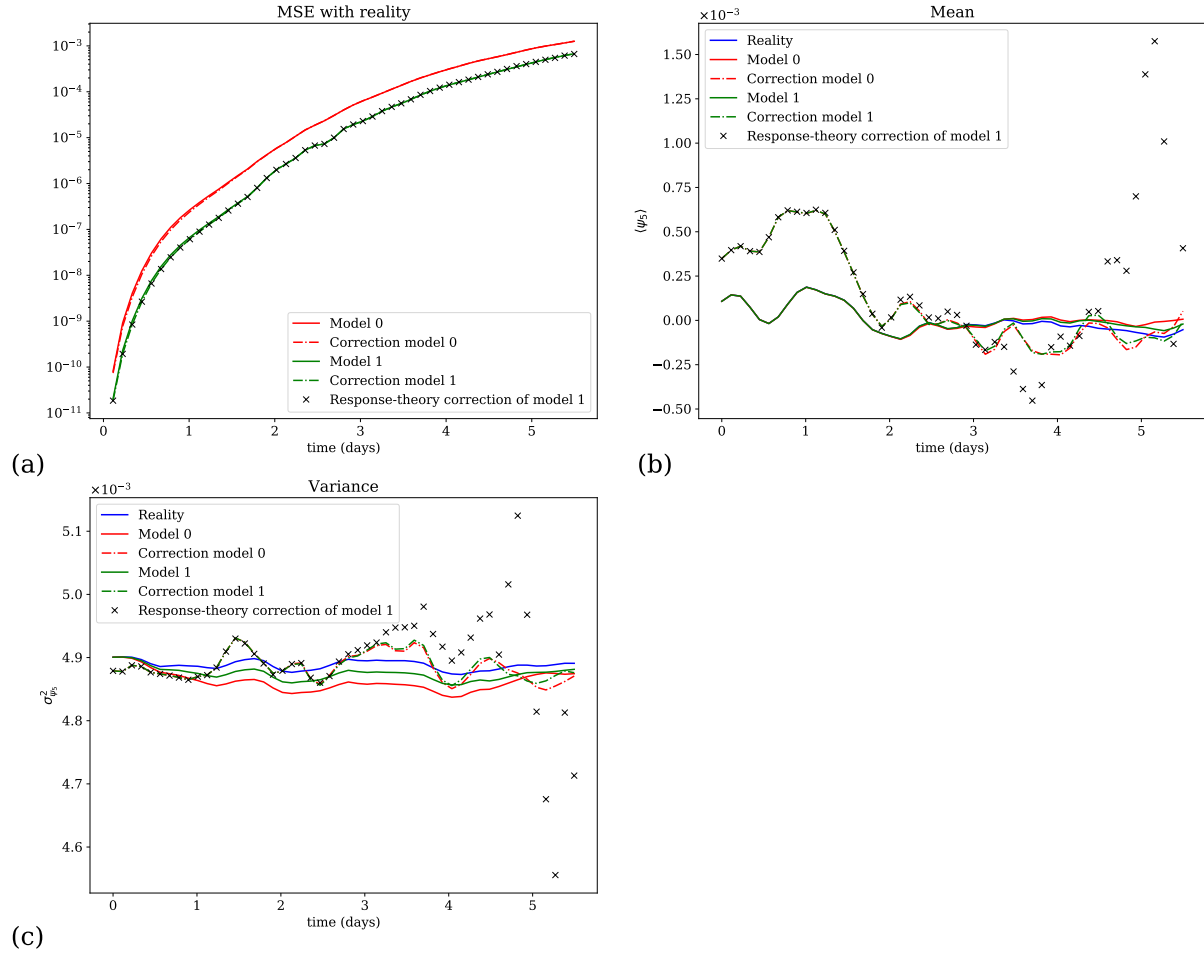


2.5 Variable ψ_5

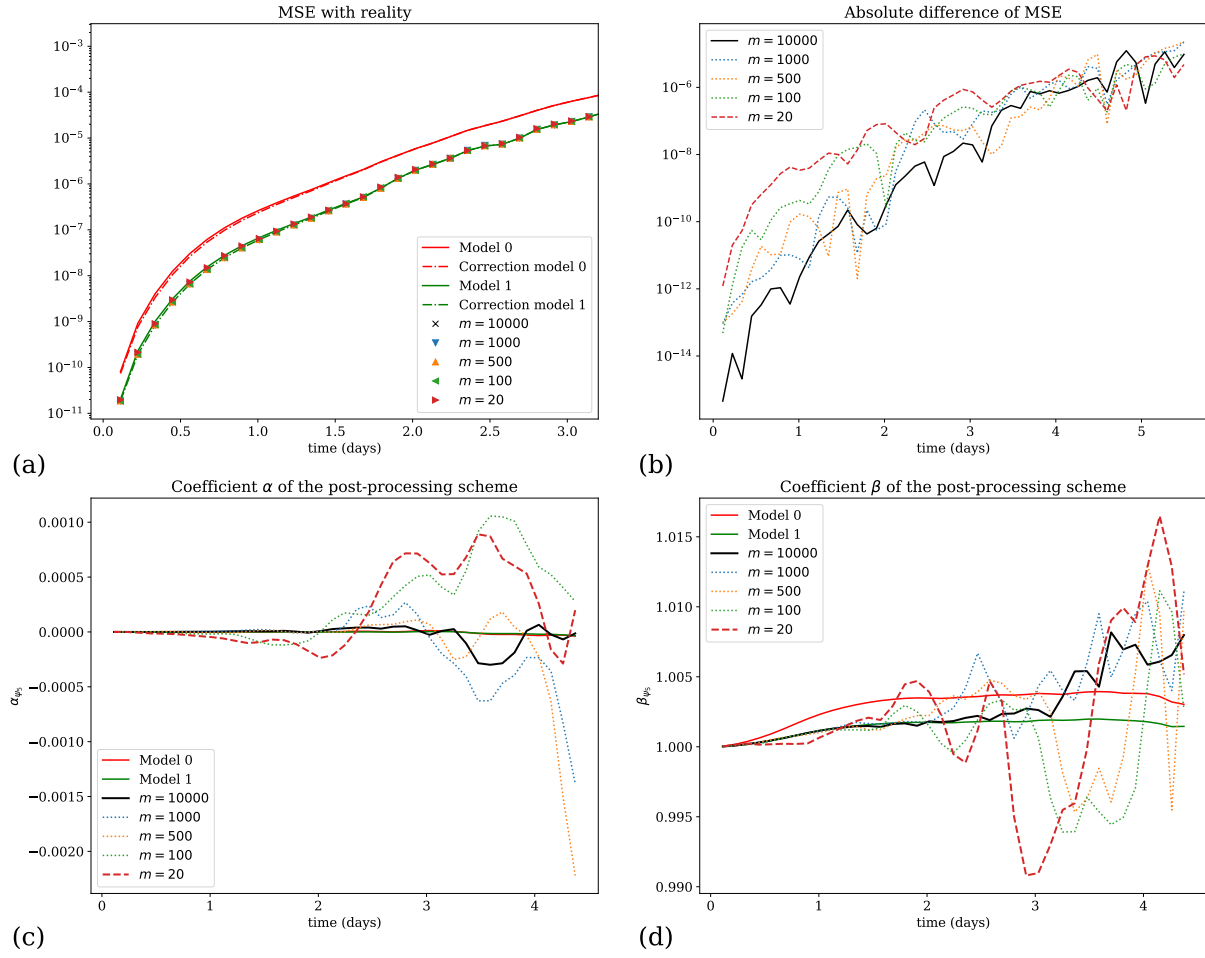
2.5.1 Corrections of the moments of the variable



2.5.2 Performance of the correction

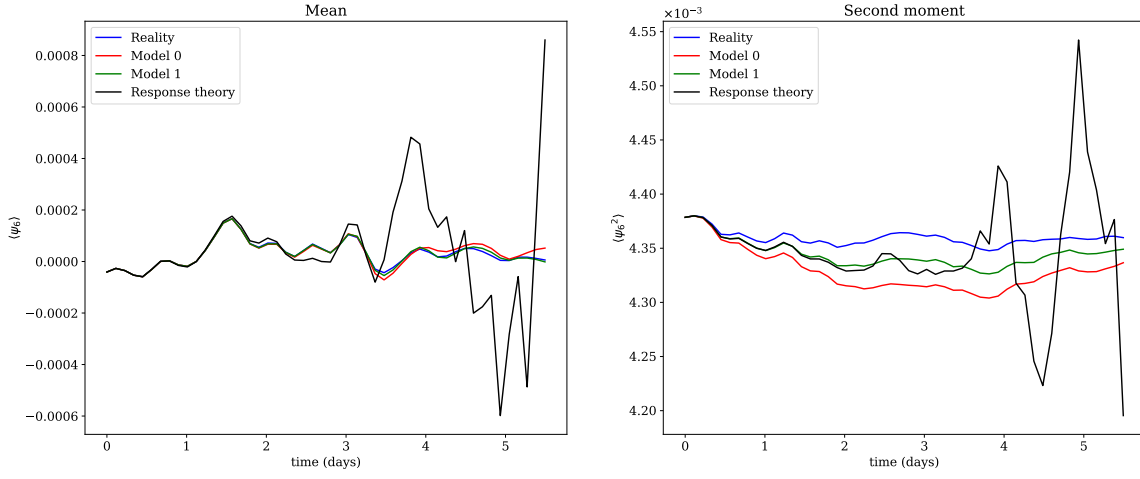


2.5.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

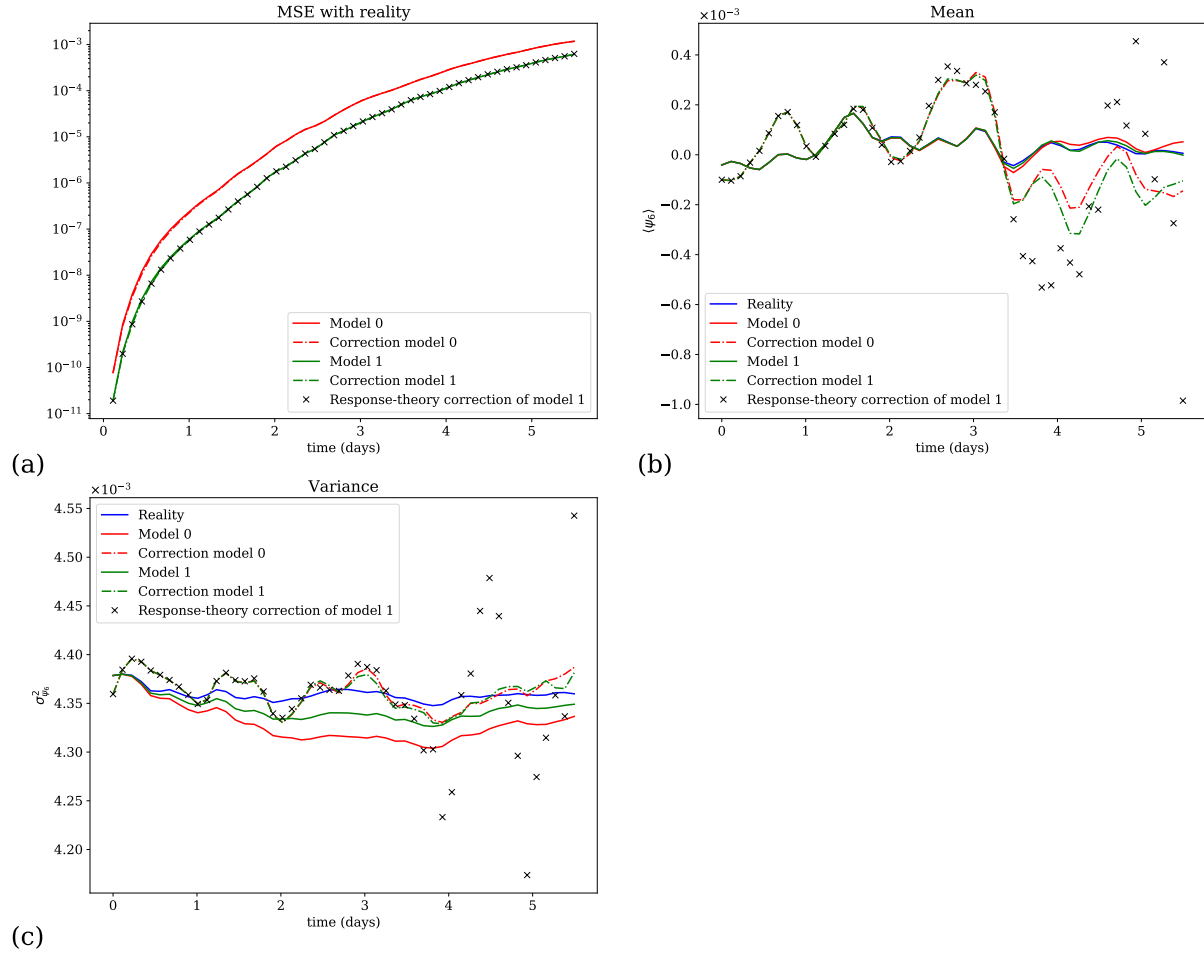


2.6 Variable ψ_6

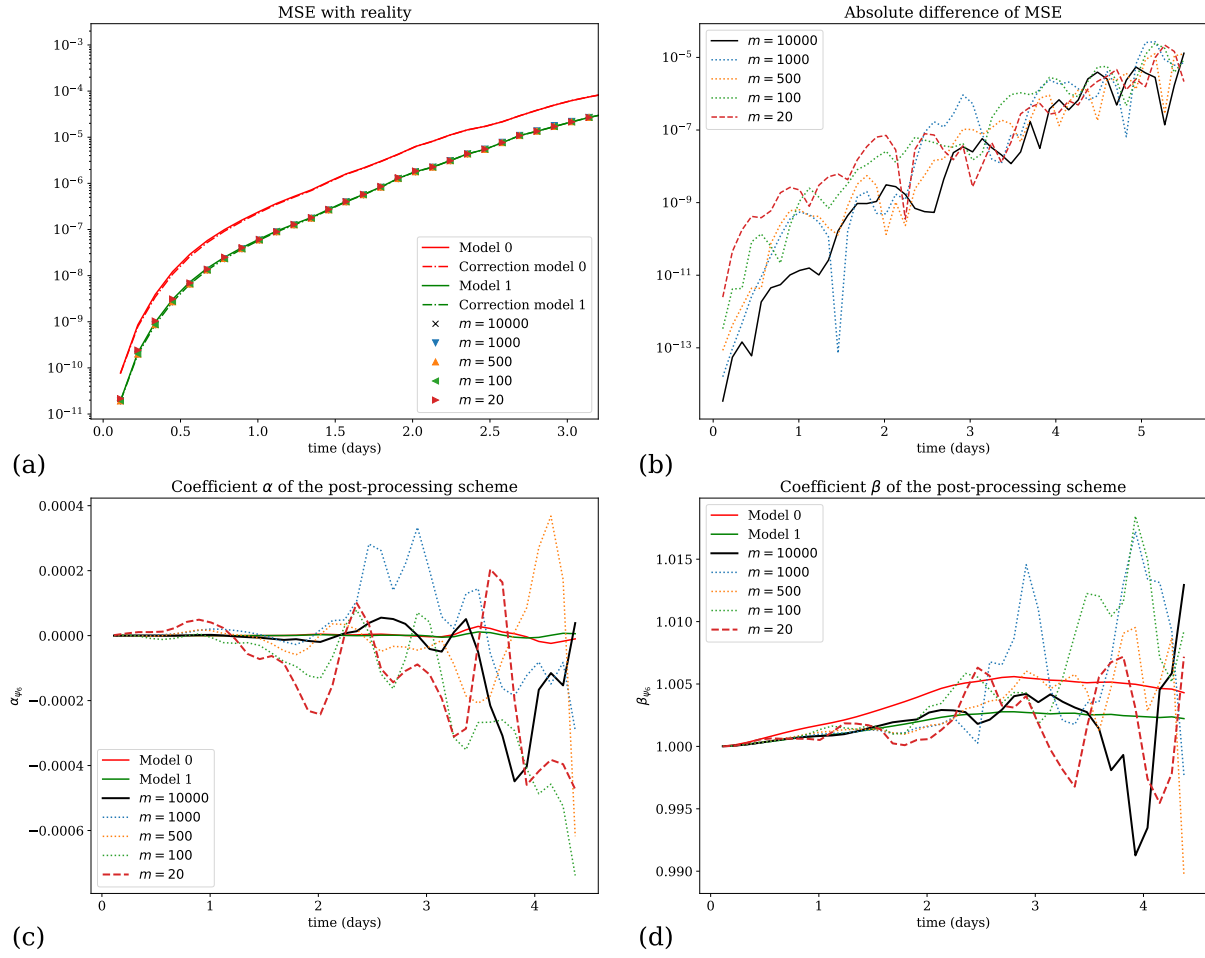
2.6.1 Corrections of the moments of the variable



2.6.2 Performance of the correction

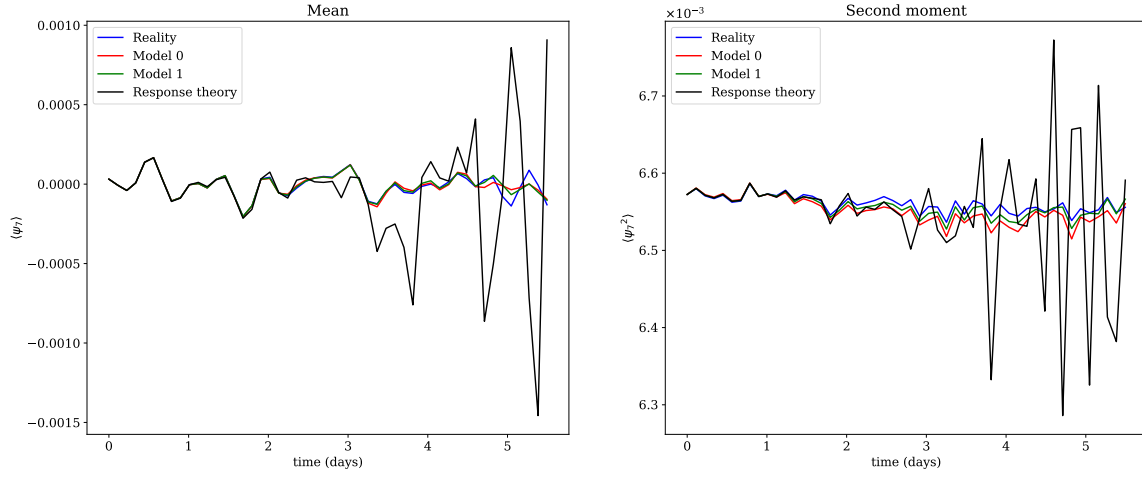


2.6.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

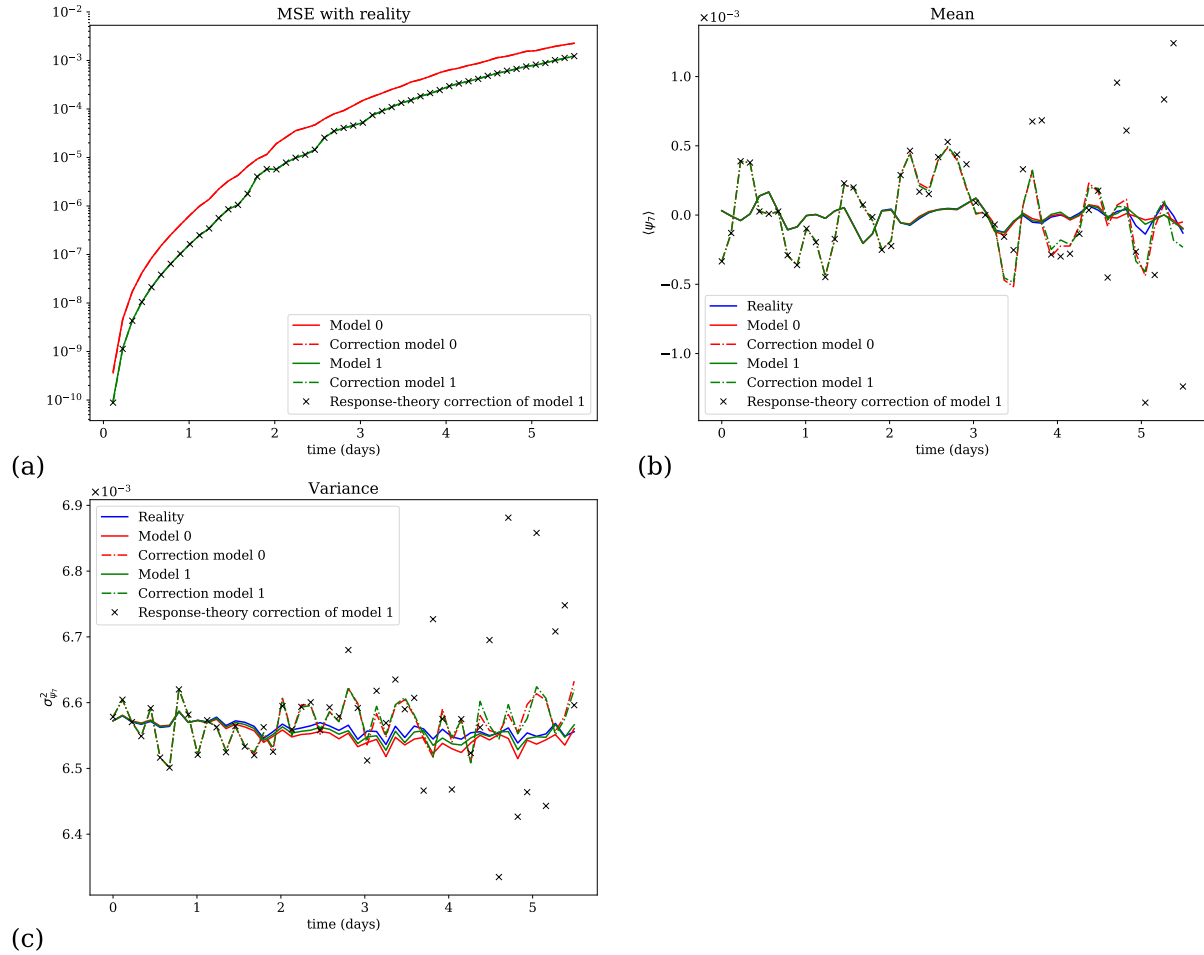


2.7 Variable ψ_7

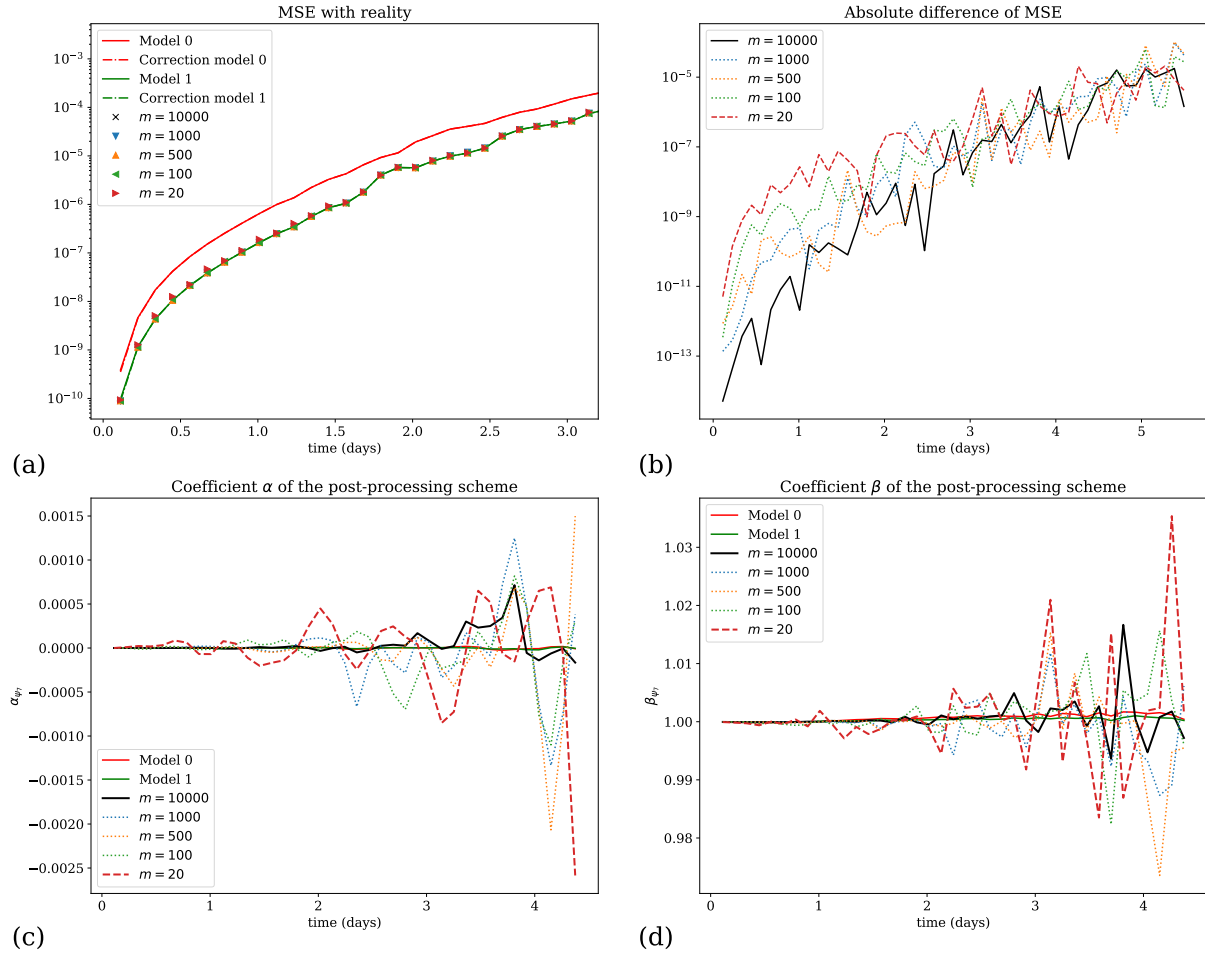
2.7.1 Corrections of the moments of the variable



2.7.2 Performance of the correction

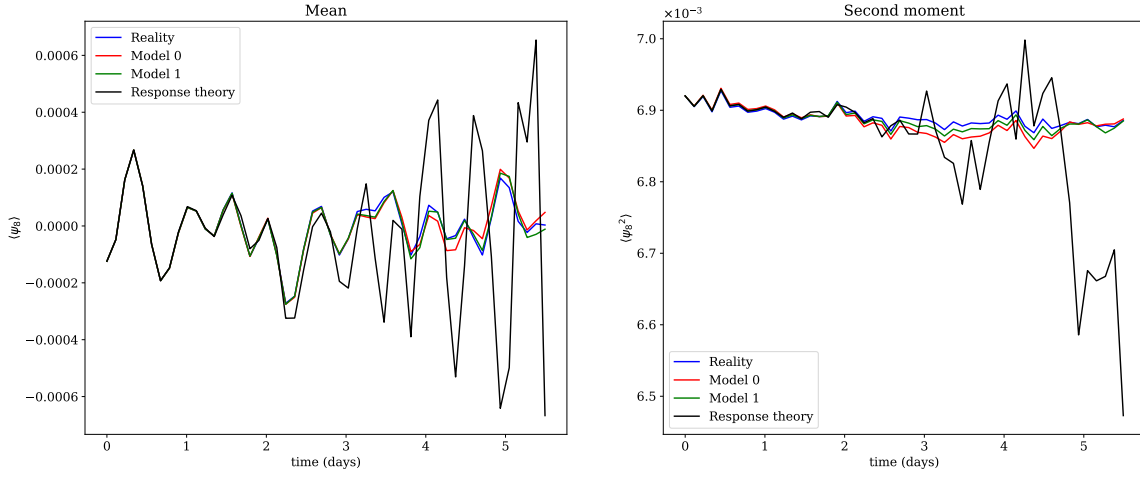


2.7.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

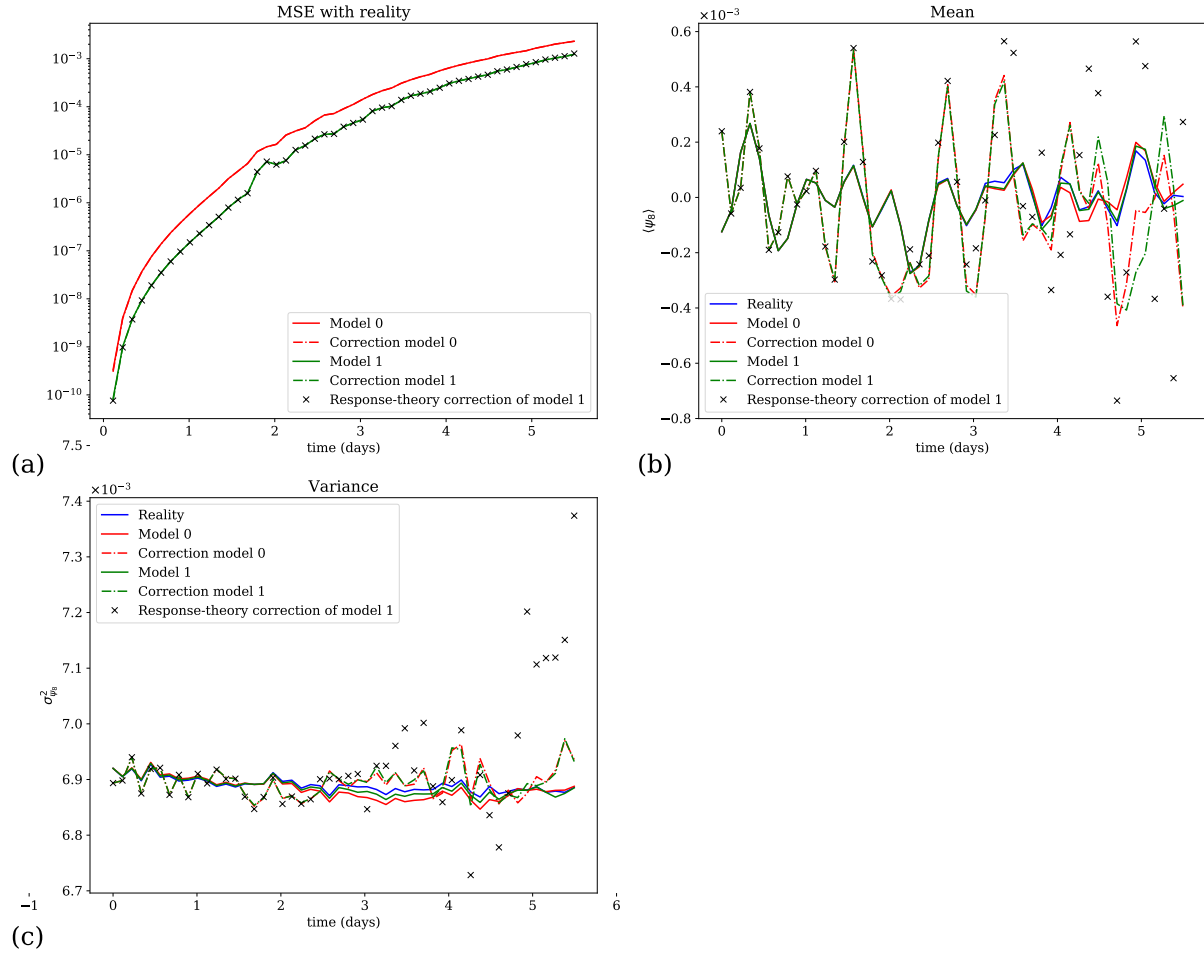


2.8 Variable ψ_8

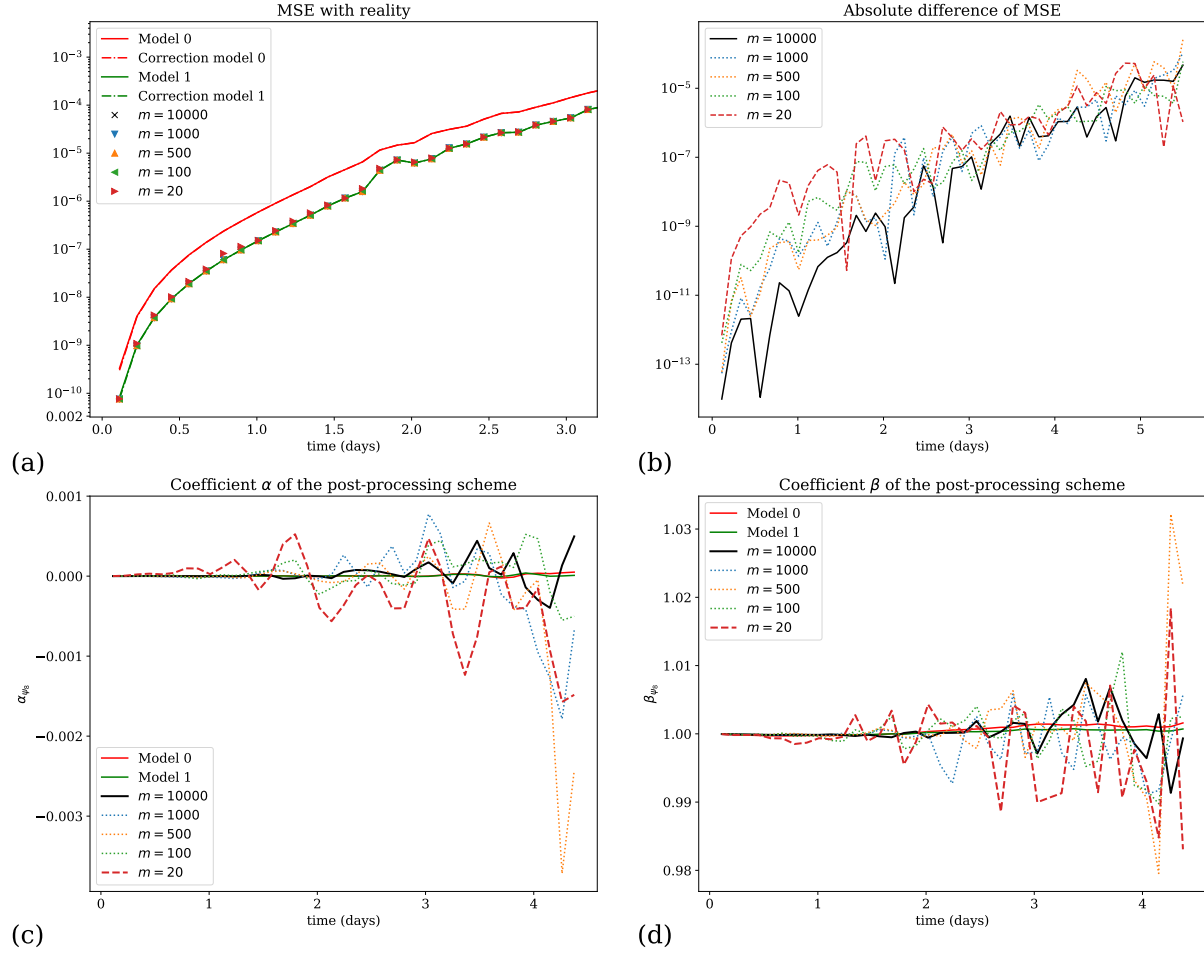
2.8.1 Corrections of the moments of the variable



2.8.2 Performance of the correction

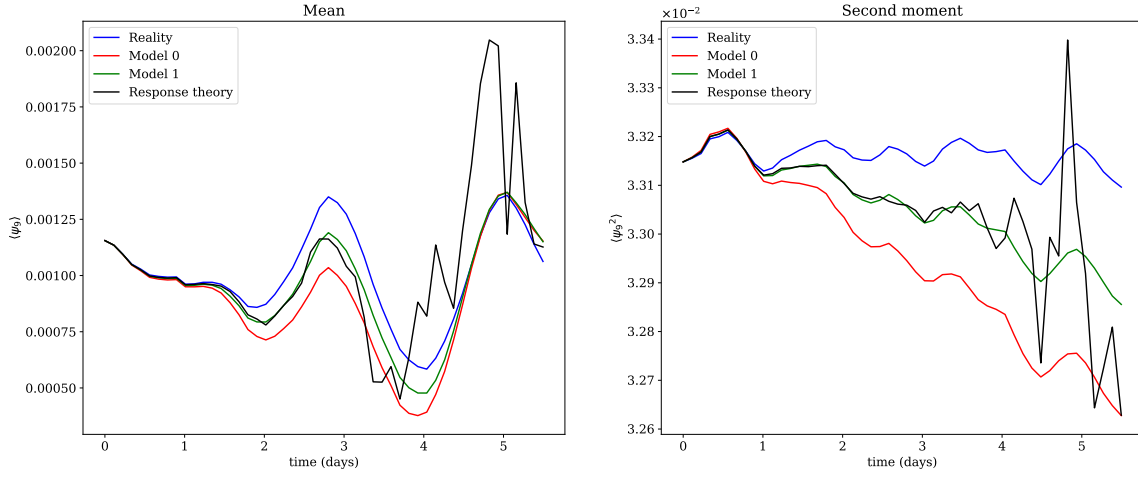


2.8.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

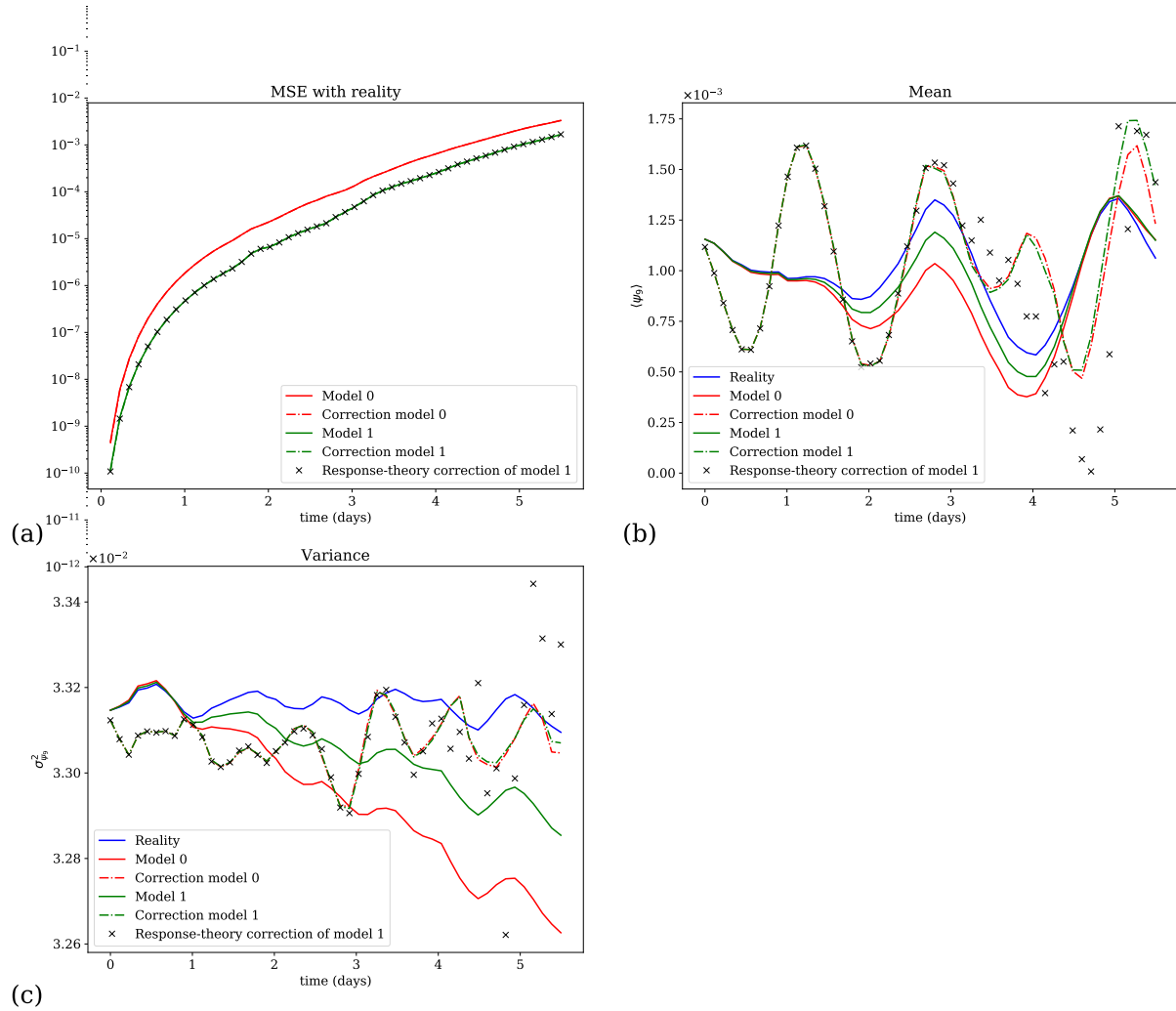


2.9 Variable ψ_9

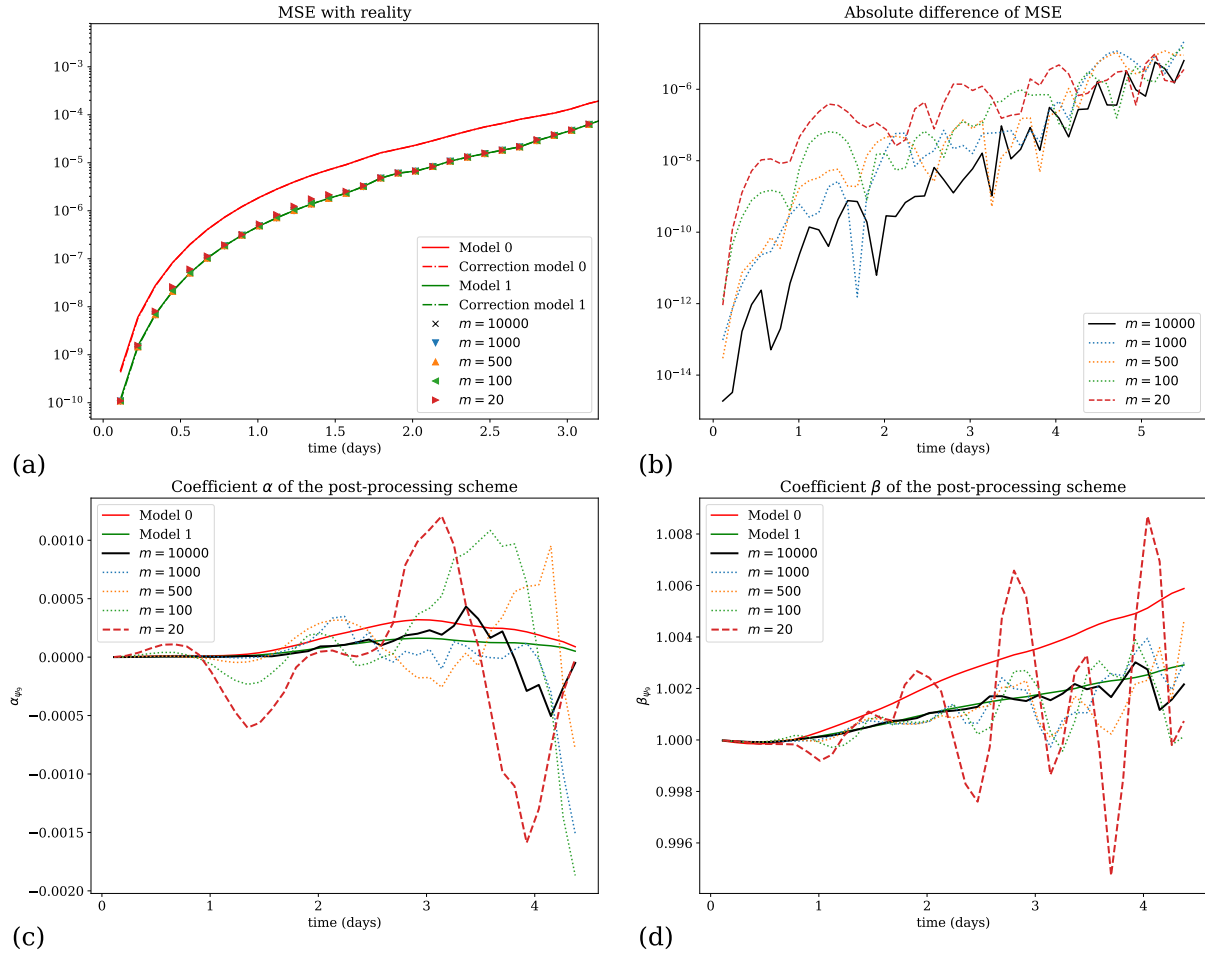
2.9.1 Corrections of the moments of the variable



2.9.2 Performance of the correction

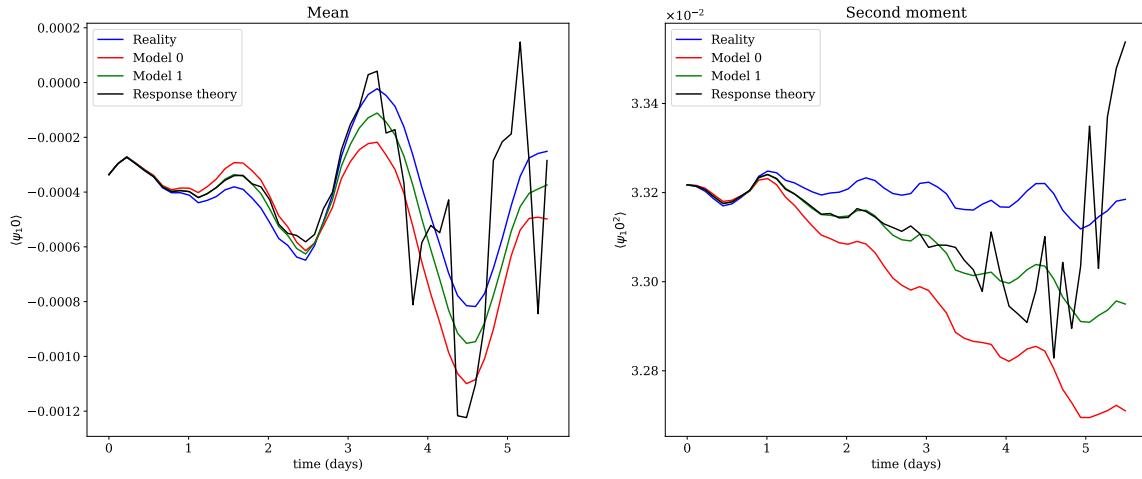


2.9.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

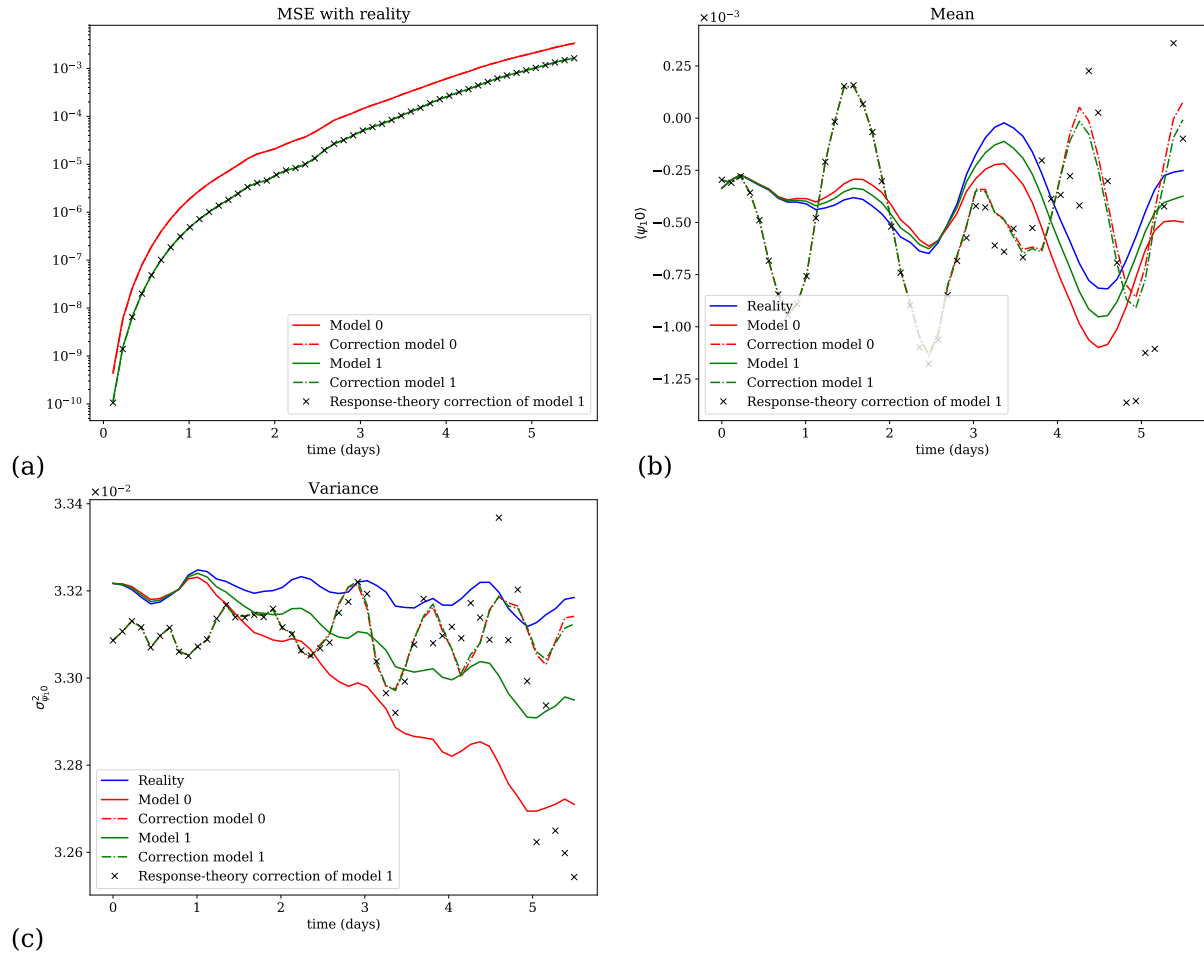


2.10 Variable ψ_{10}

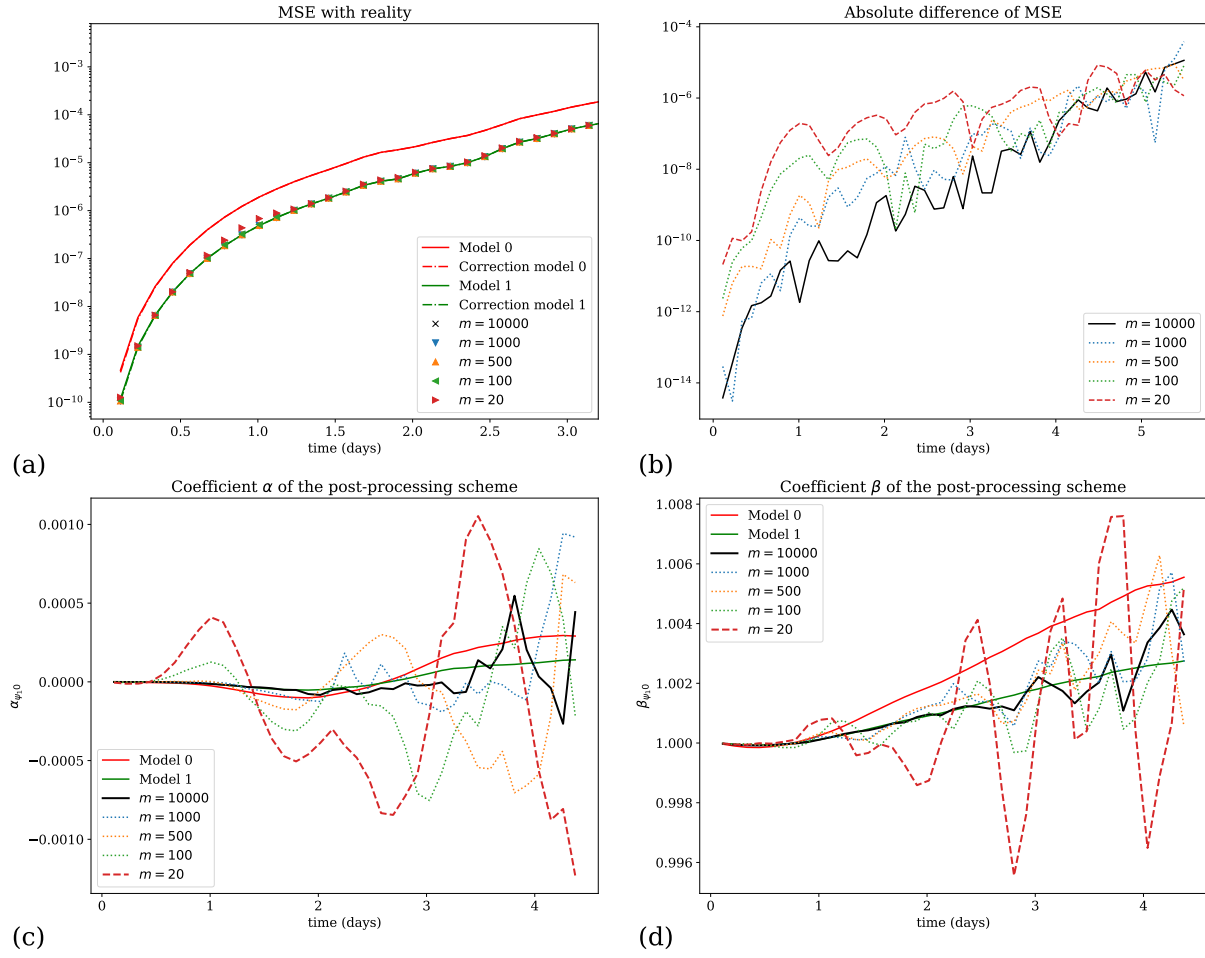
2.10.1 Corrections of the moments of the variable



2.10.2 Performance of the correction

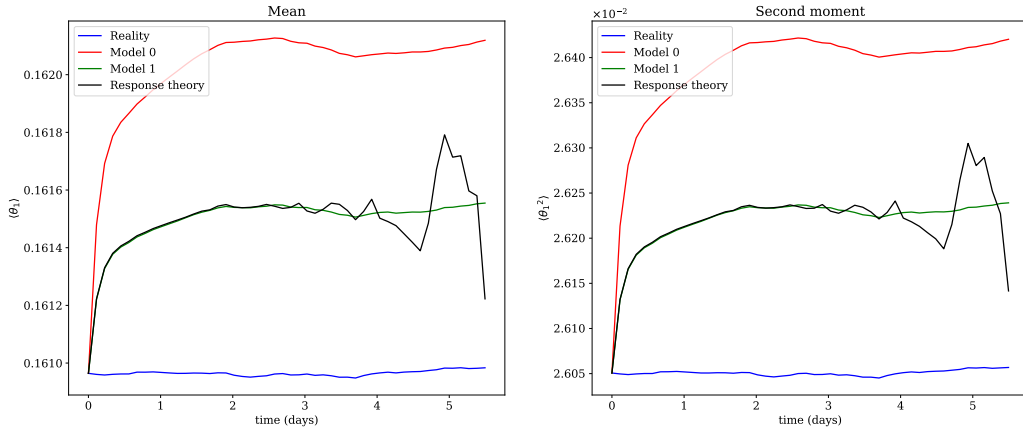


2.10.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

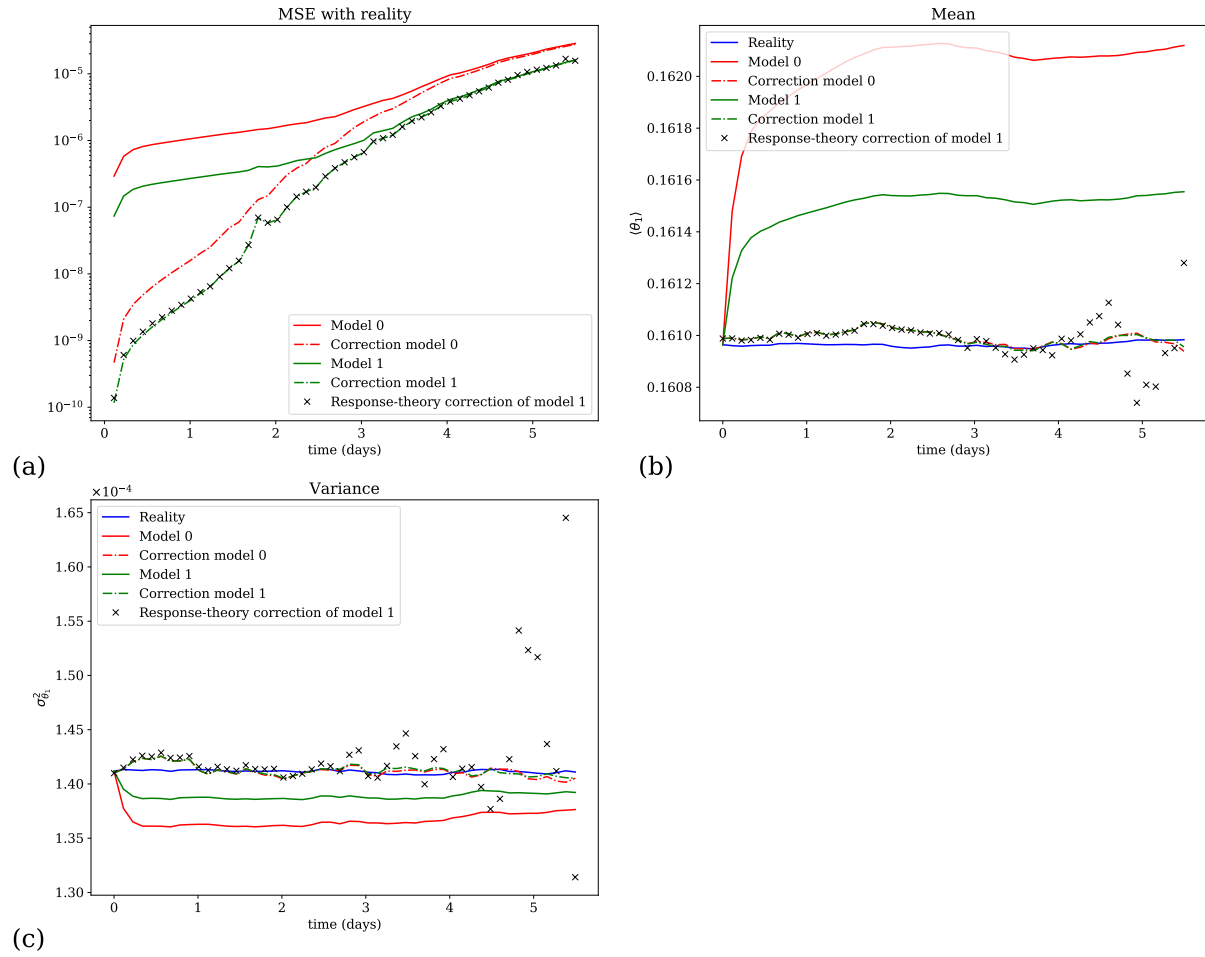


2.11 Variable θ_1

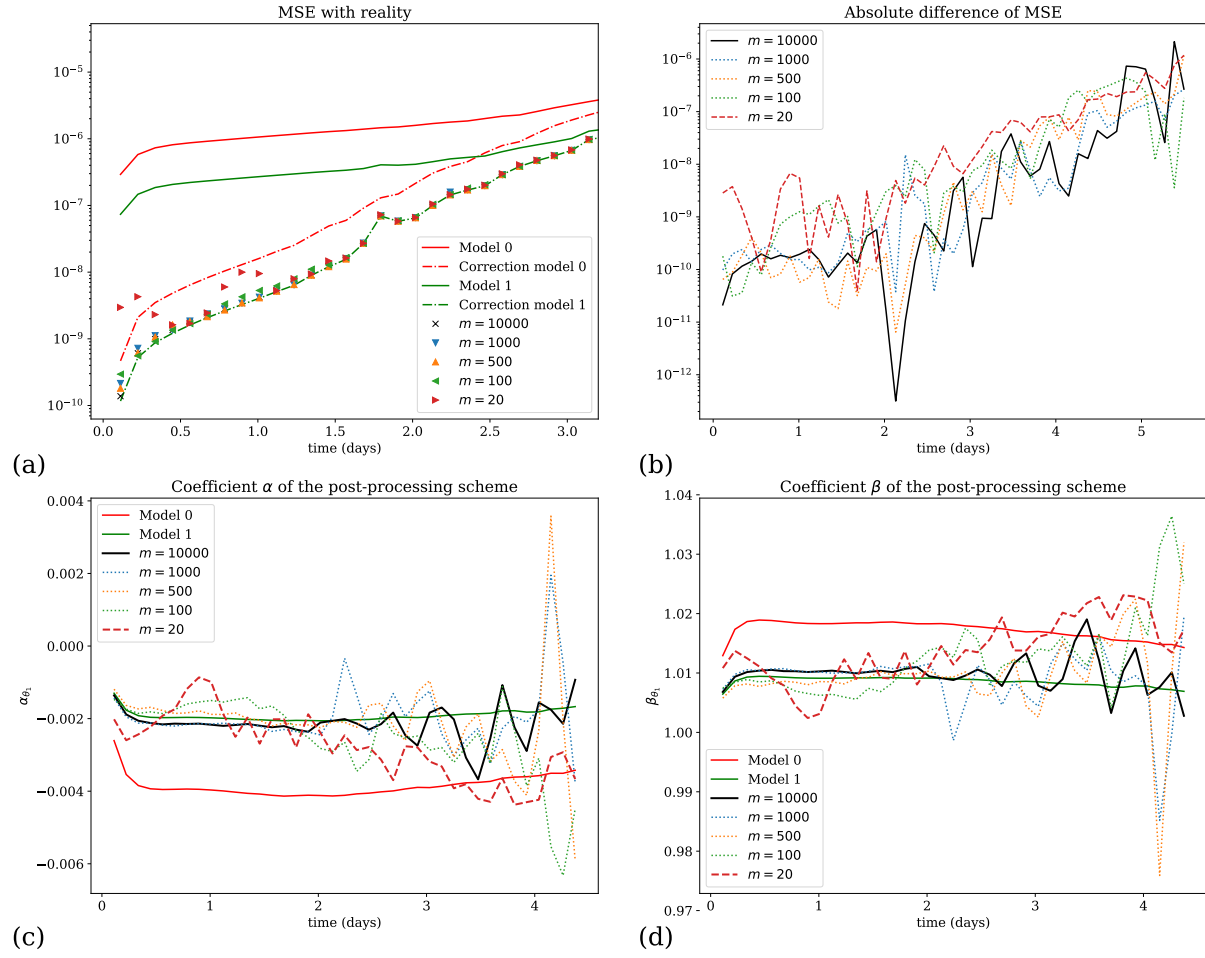
2.11.1 Corrections of the moments of the variable



2.11.2 Performance of the correction

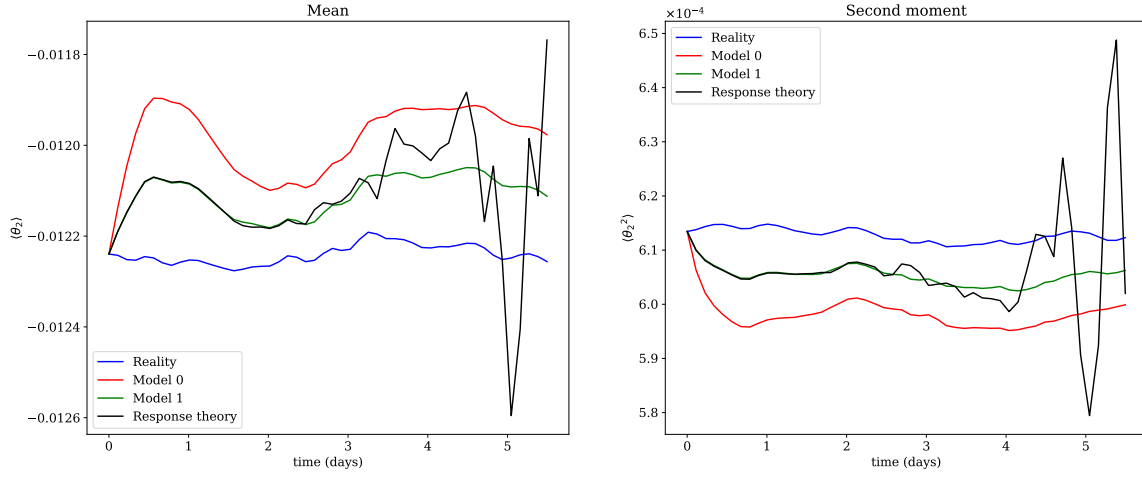


2.11.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

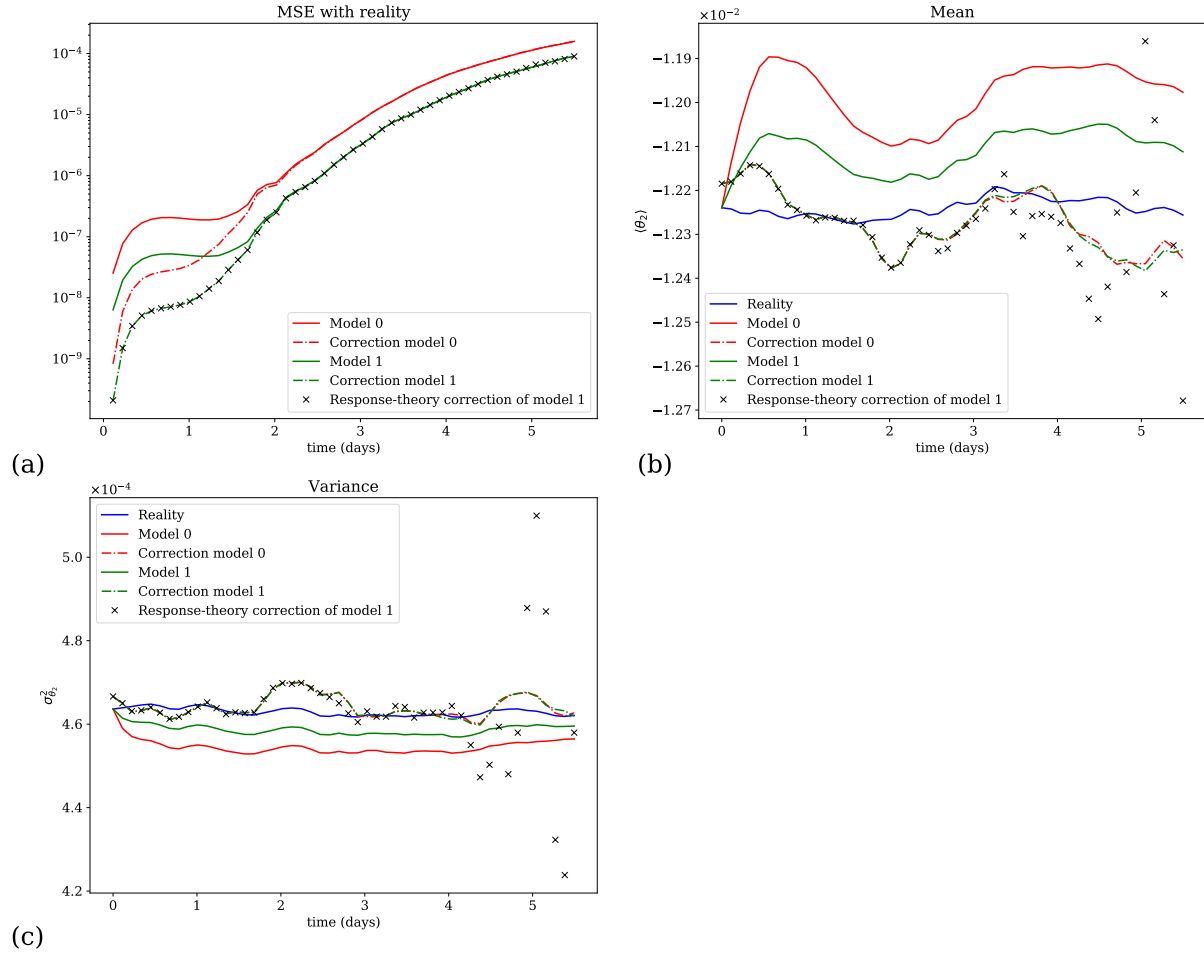


2.12 Variable θ_2

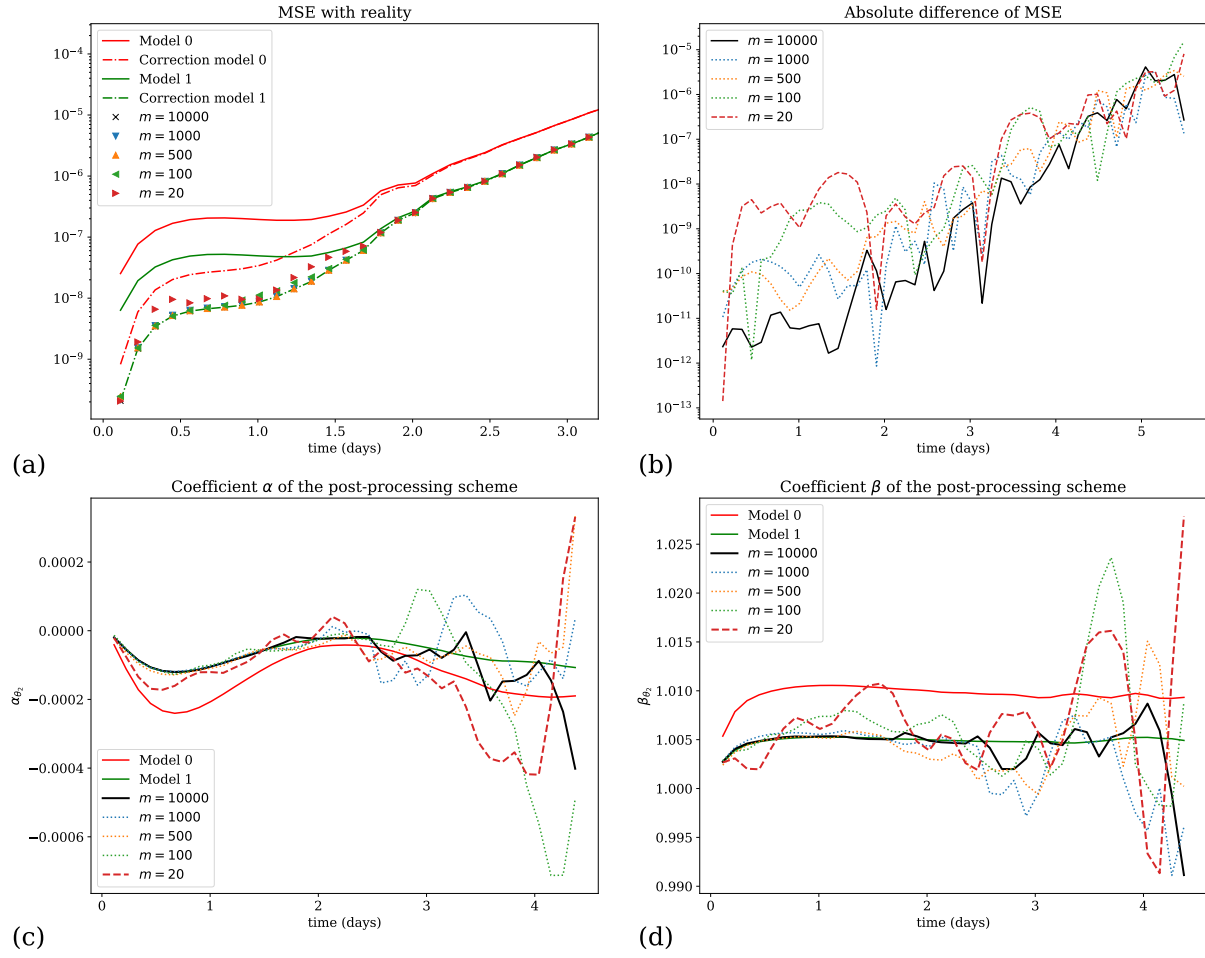
2.12.1 Corrections of the moments of the variable



2.12.2 Performance of the correction

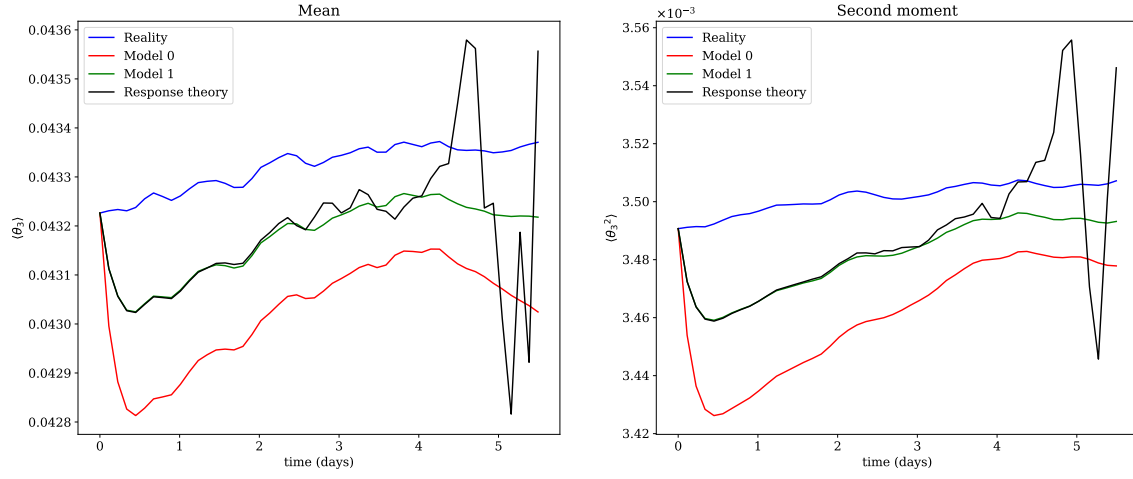


2.12.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

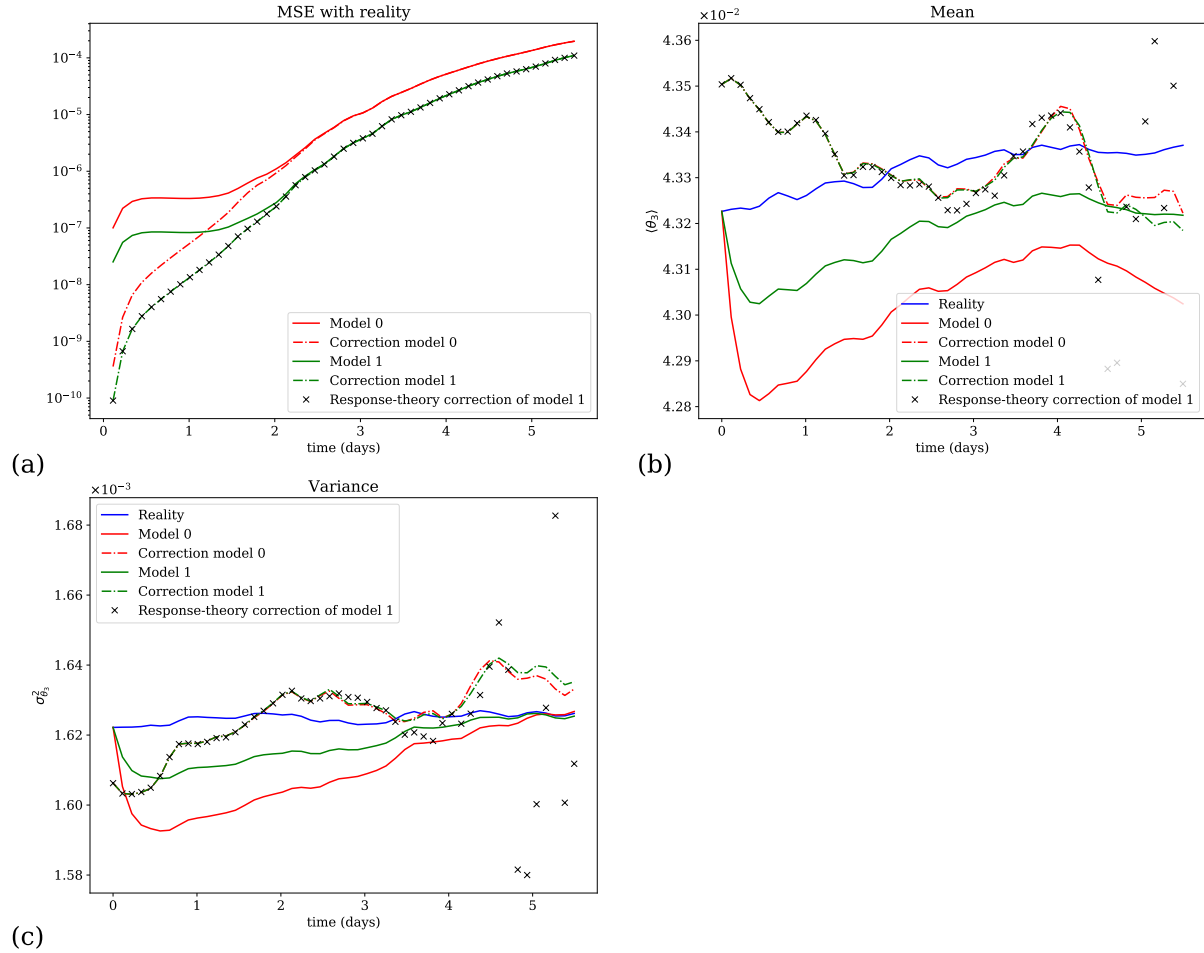


2.13 Variable θ_3

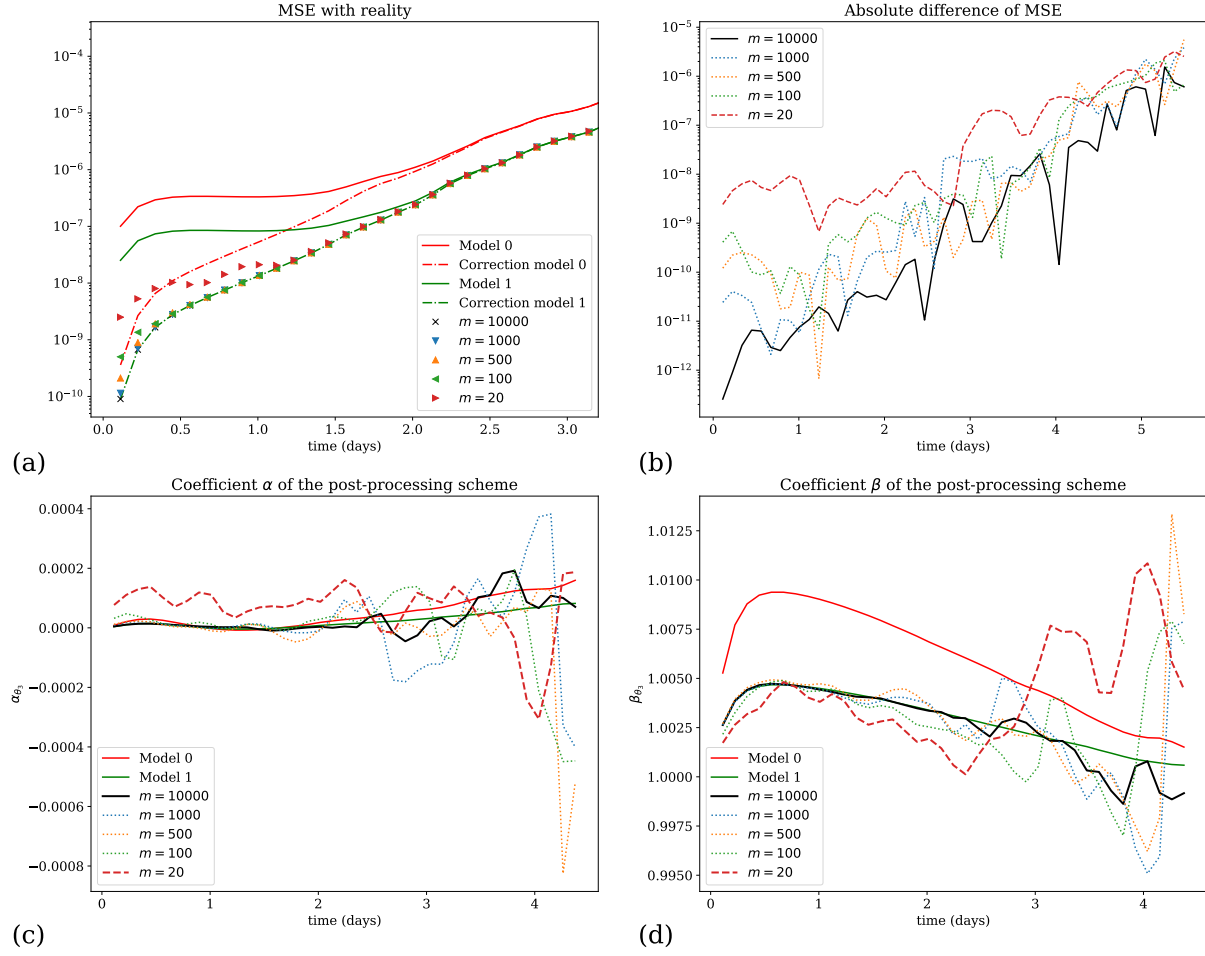
2.13.1 Corrections of the moments of the variable



2.13.2 Performance of the correction

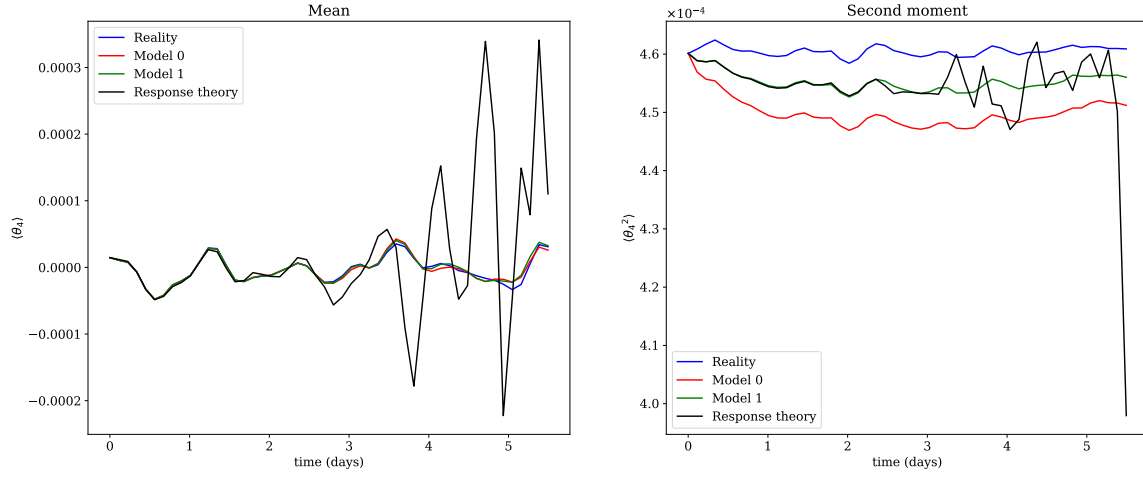


2.13.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

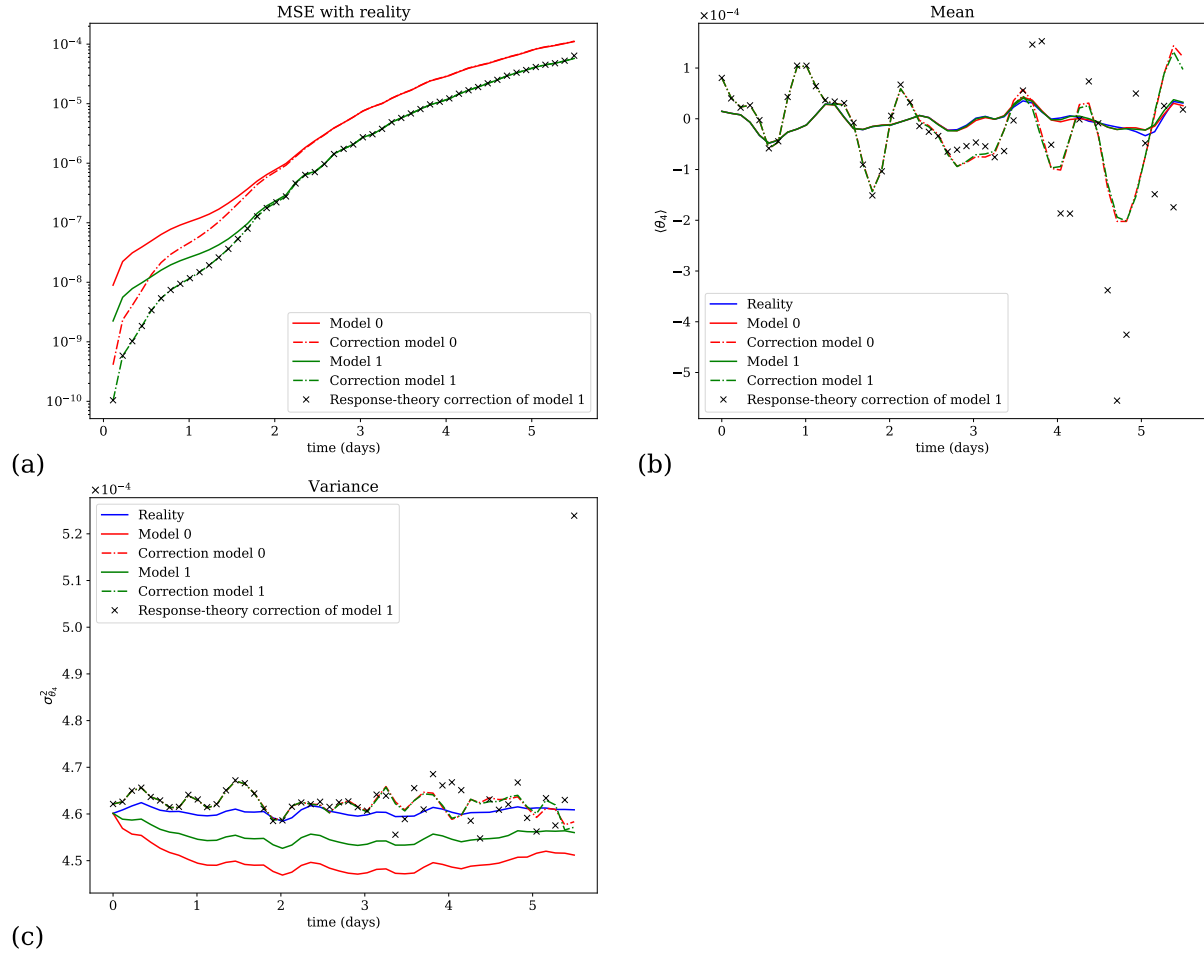


2.14 Variable θ_4

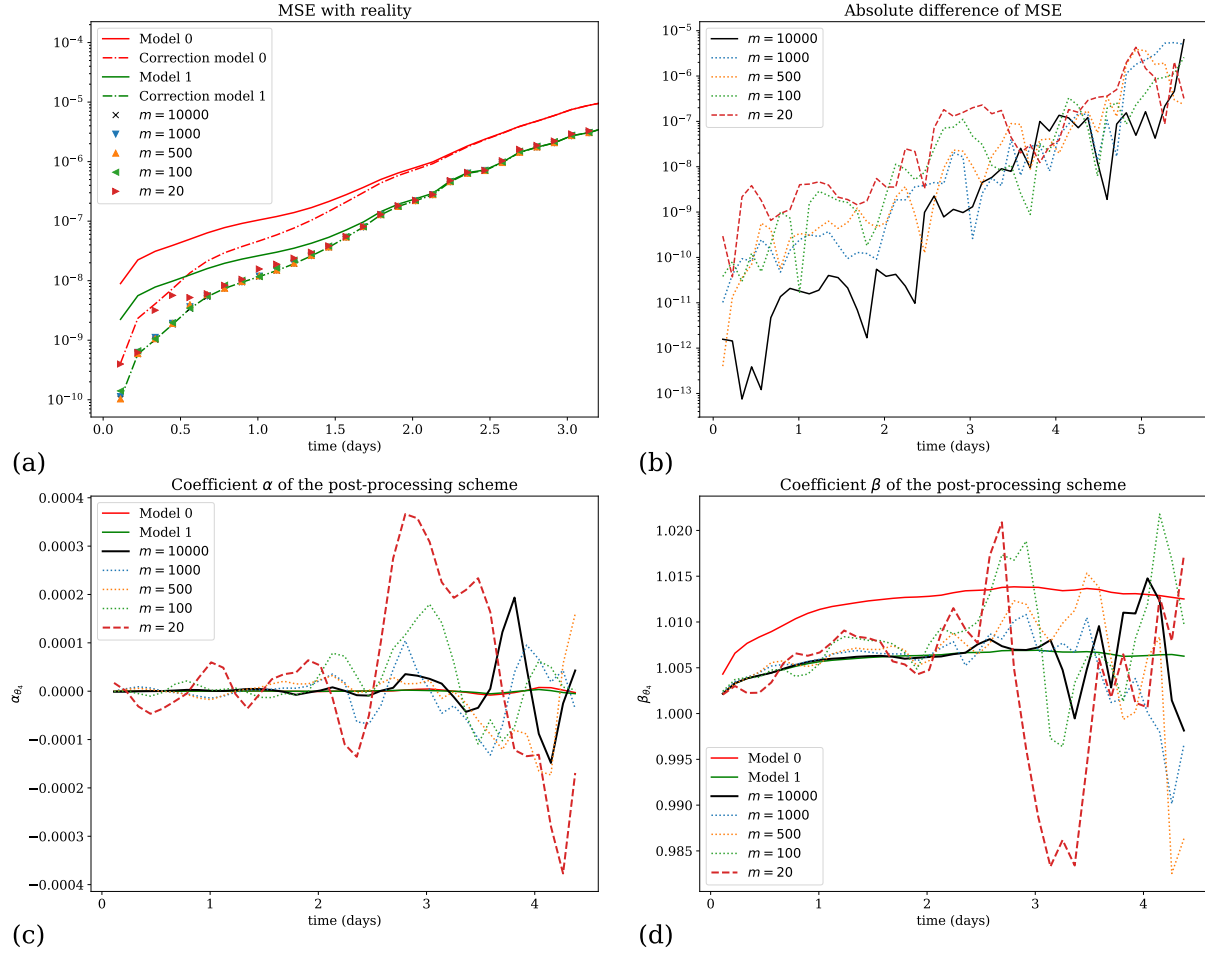
2.14.1 Corrections of the moments of the variable



2.14.2 Performance of the correction

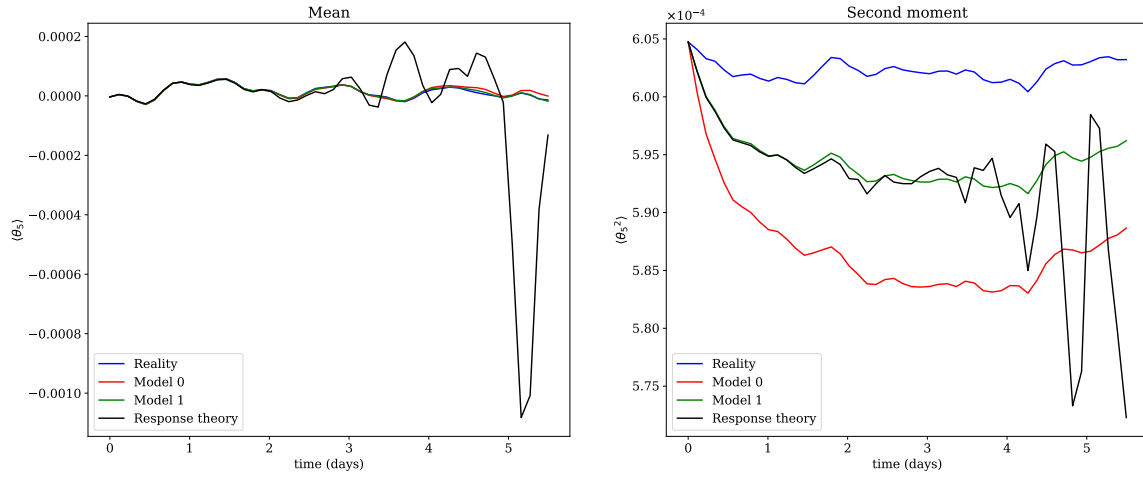


2.14.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

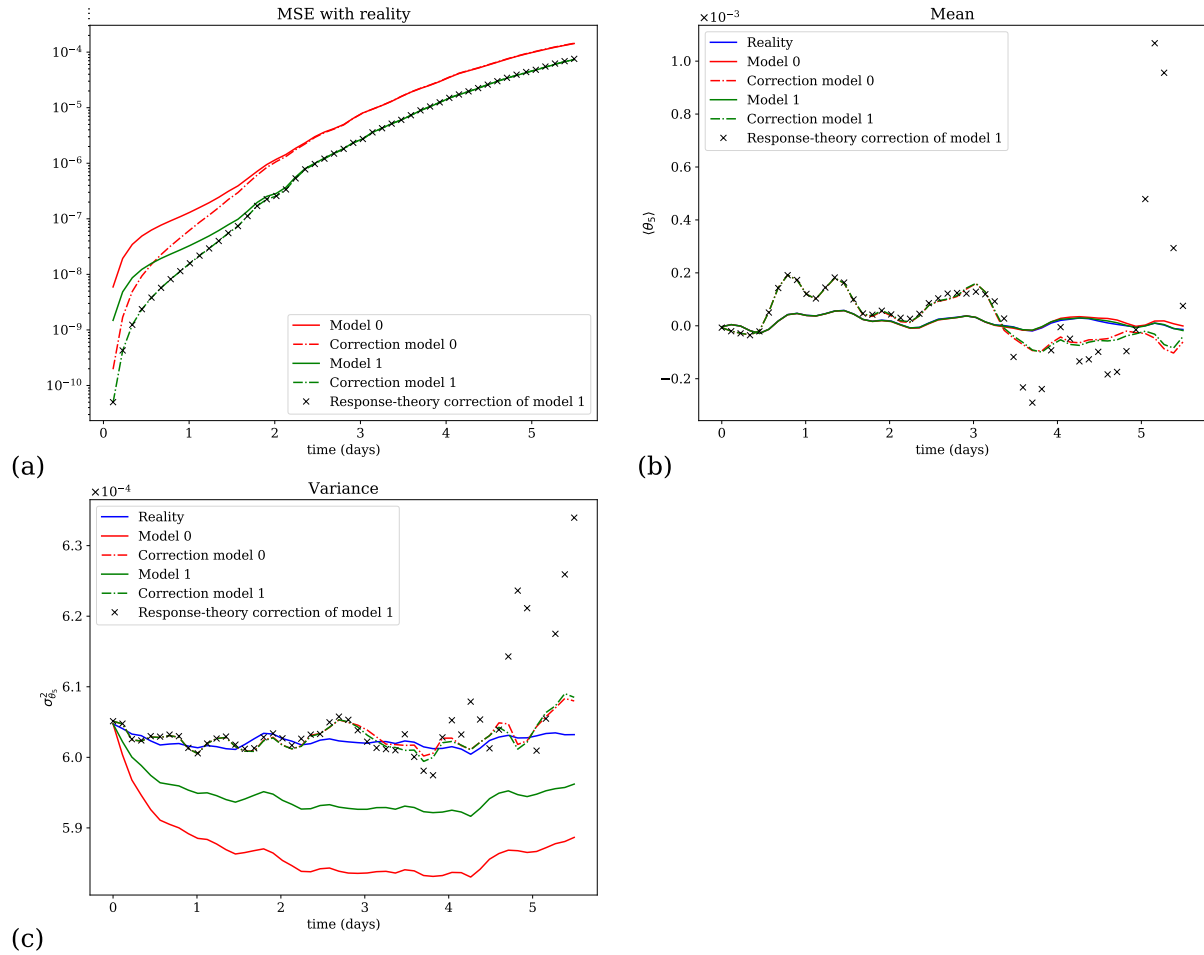


2.15 Variable θ_5

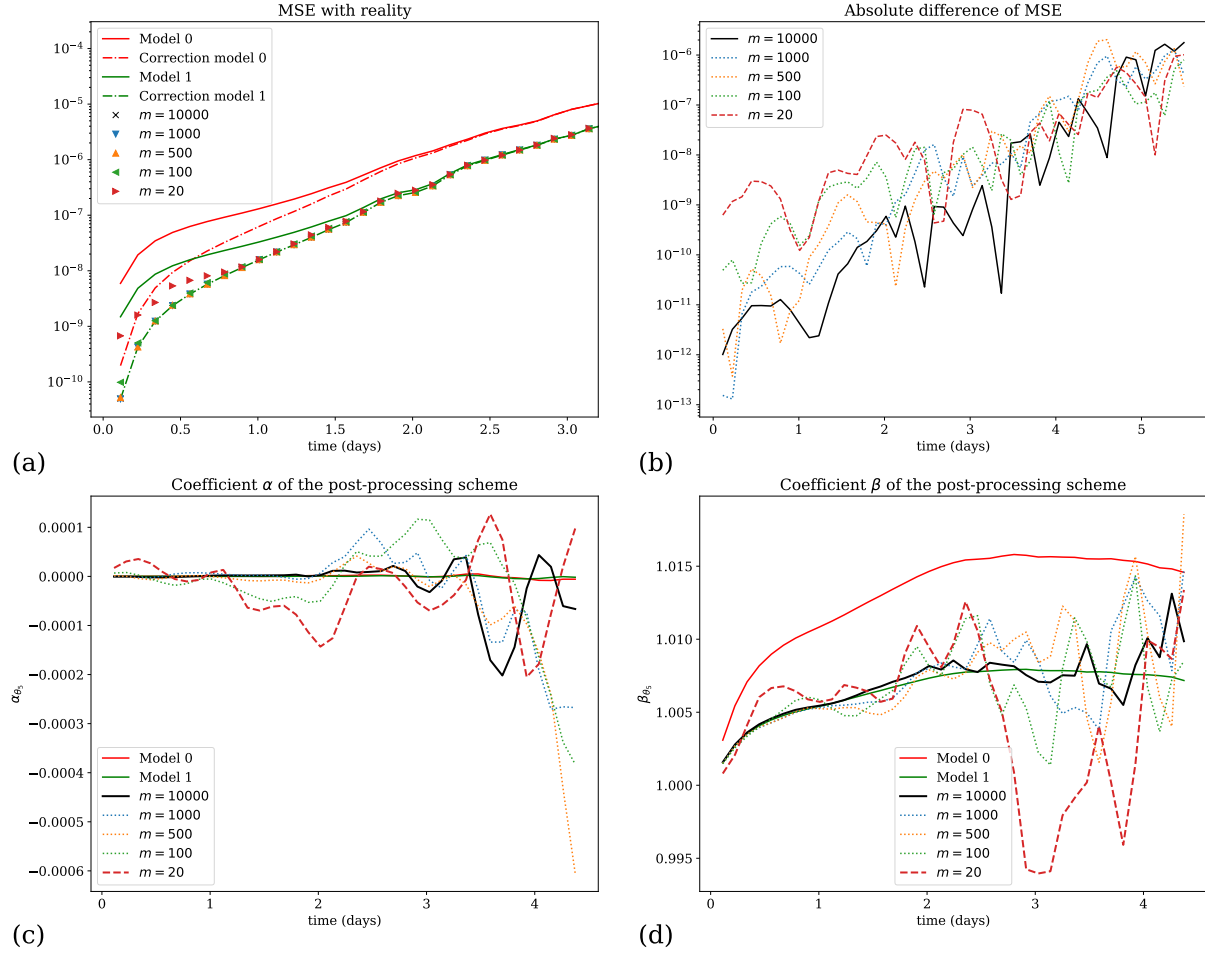
2.15.1 Corrections of the moments of the variable



2.15.2 Performance of the correction

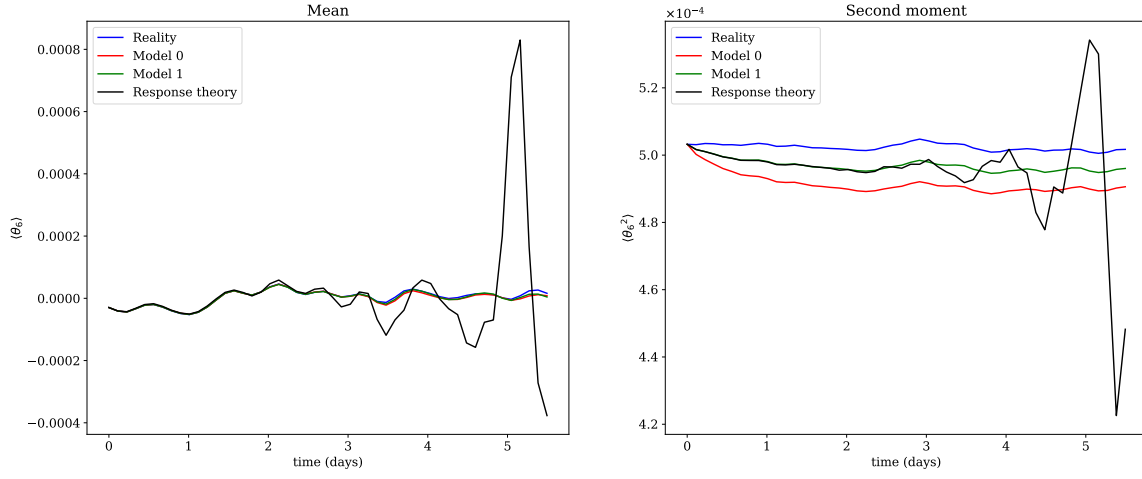


2.15.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

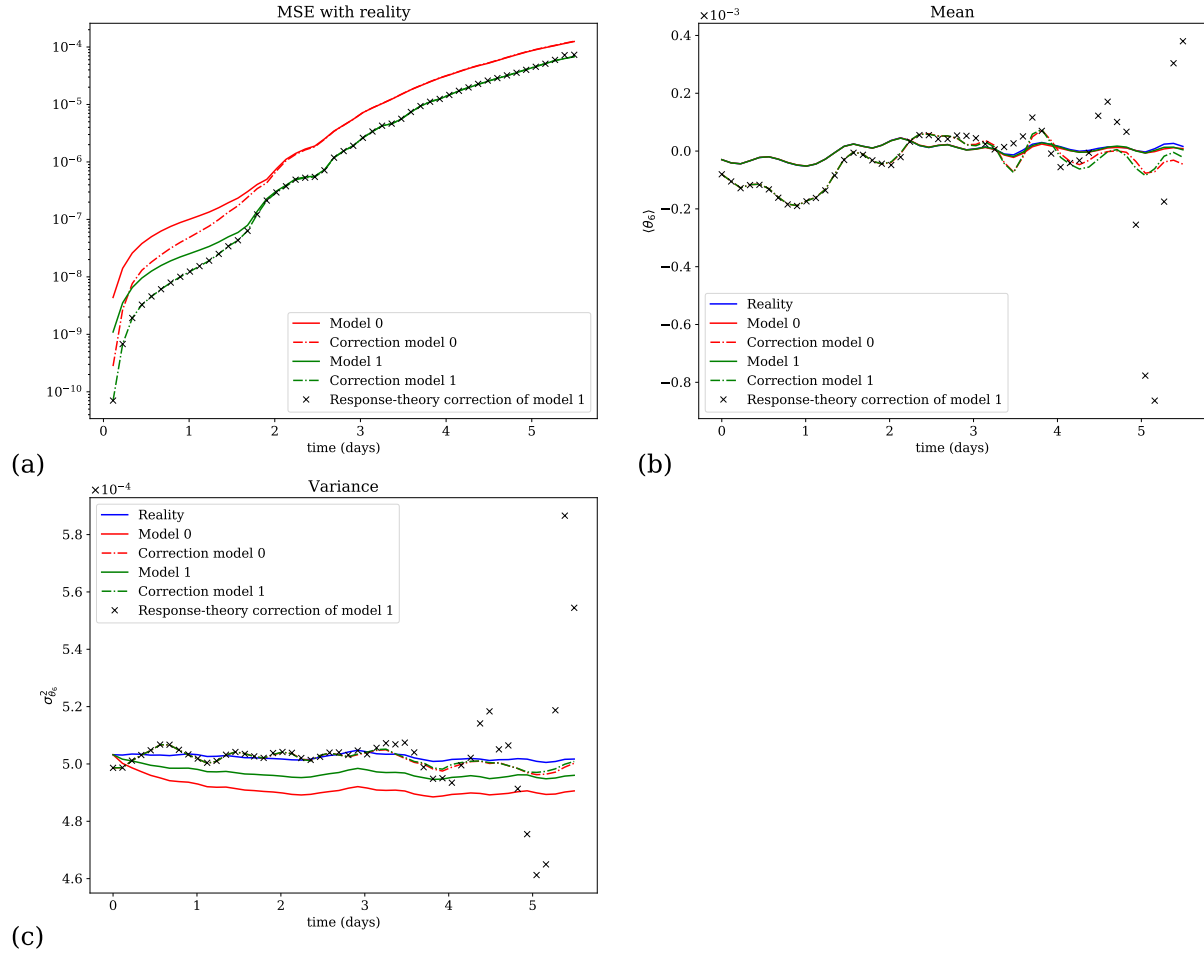


2.16 Variable θ_6

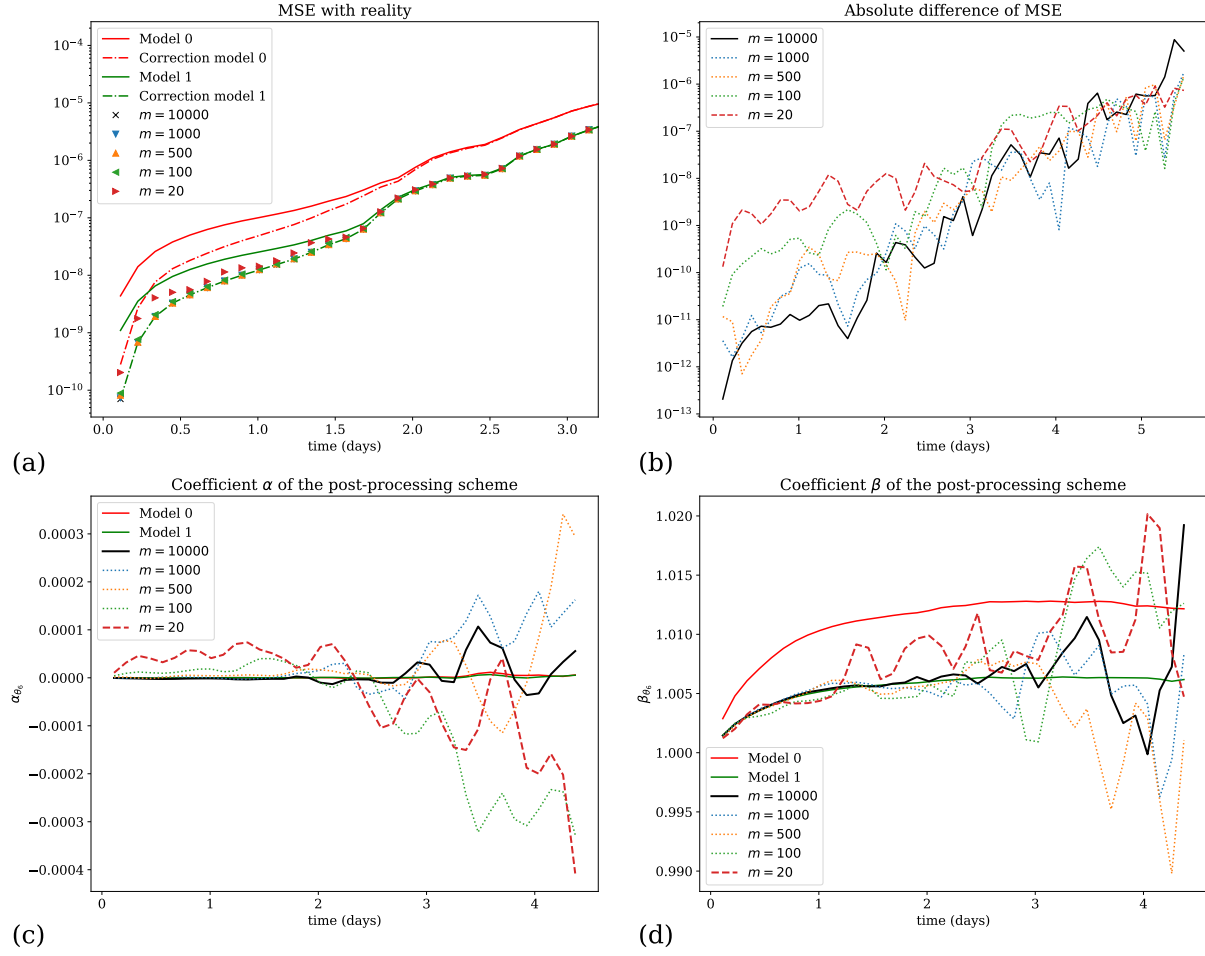
2.16.1 Corrections of the moments of the variable



2.16.2 Performance of the correction

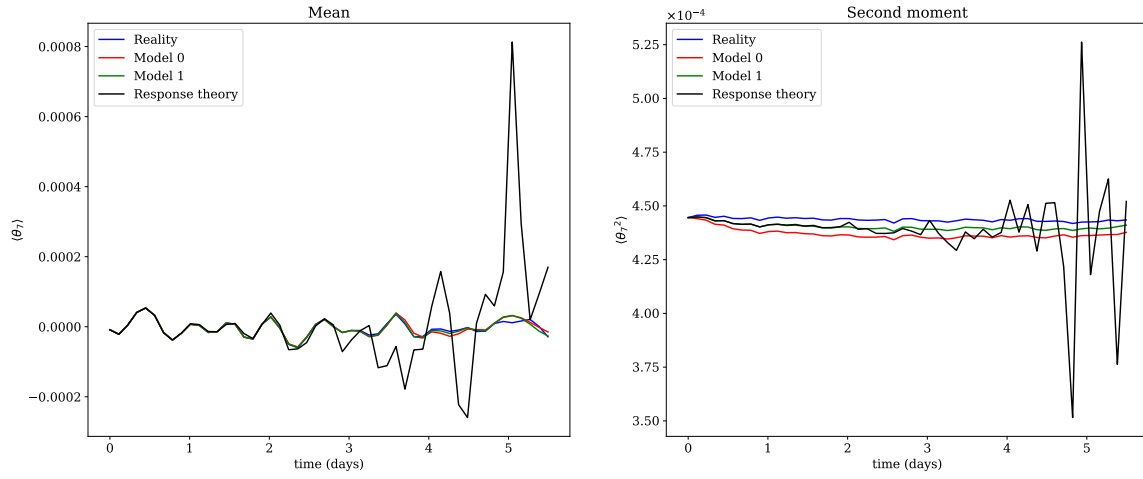


2.16.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

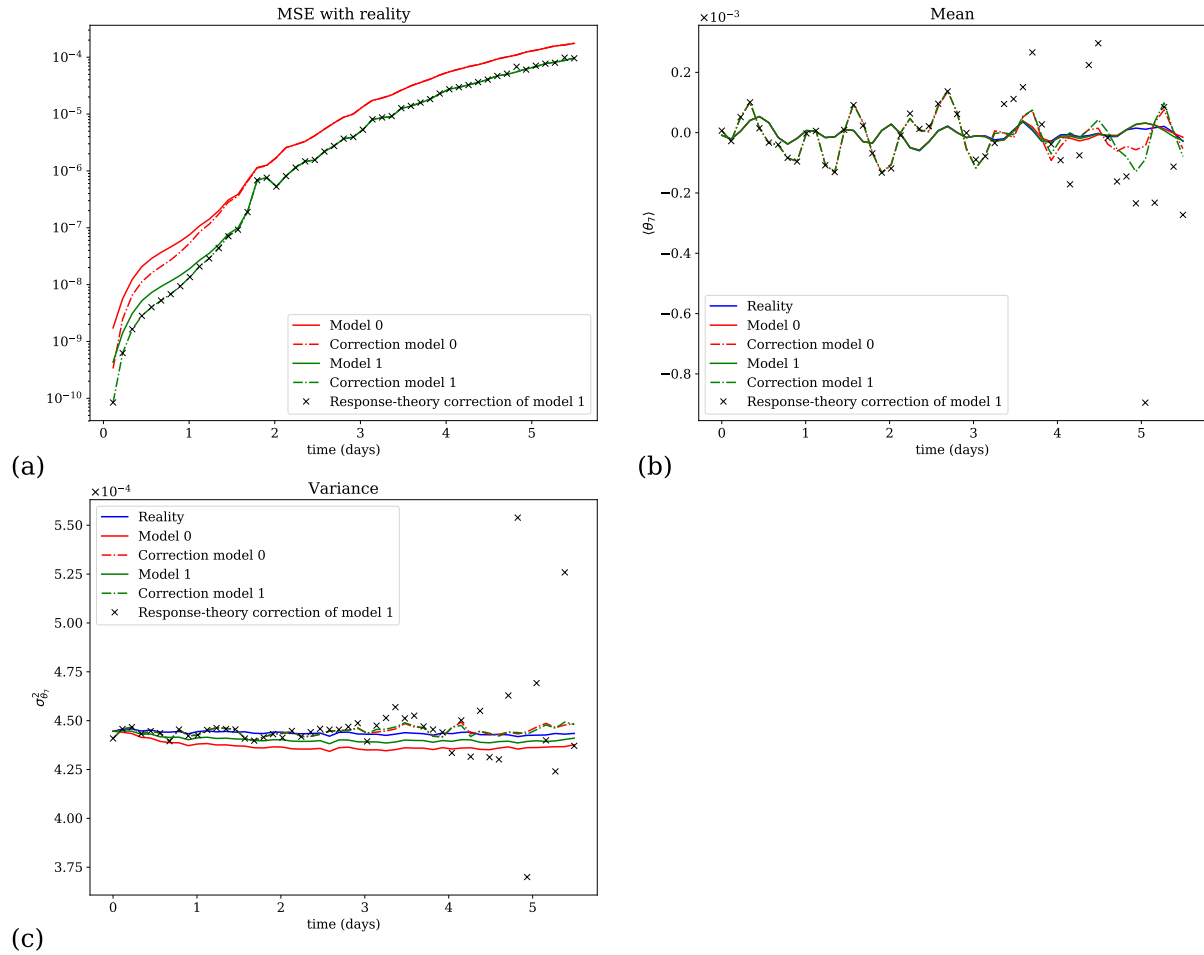


2.17 Variable θ_7

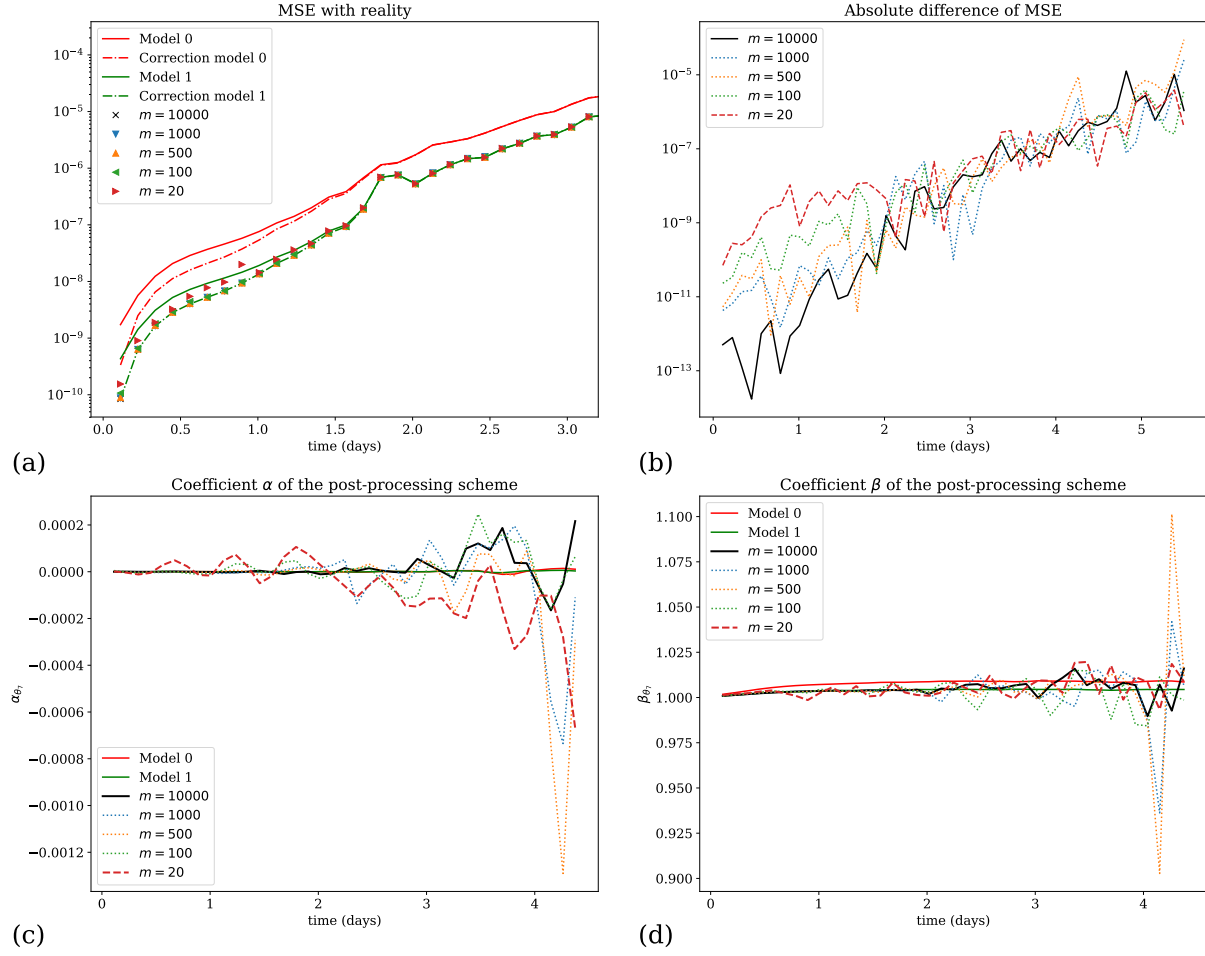
2.17.1 Corrections of the moments of the variable



2.17.2 Performance of the correction

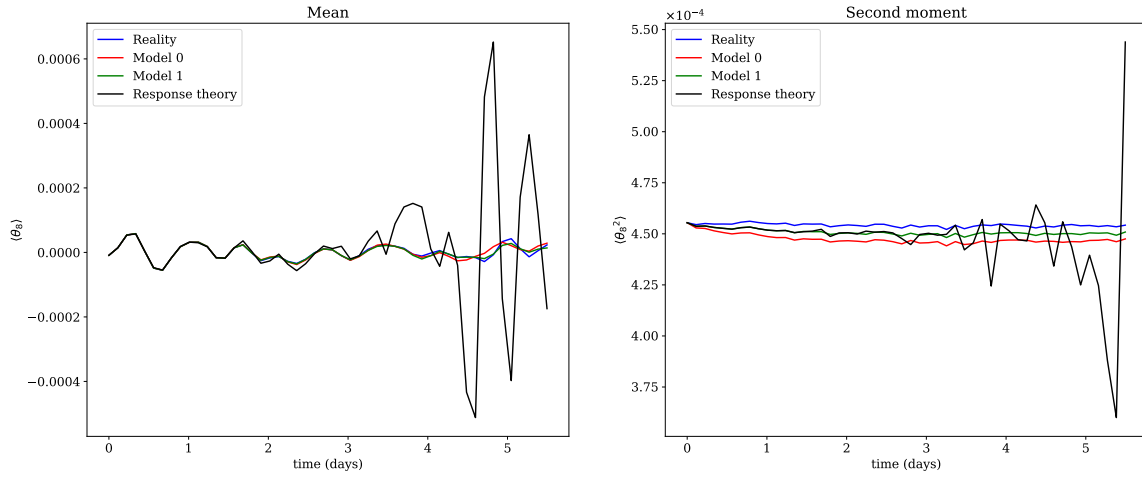


2.17.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

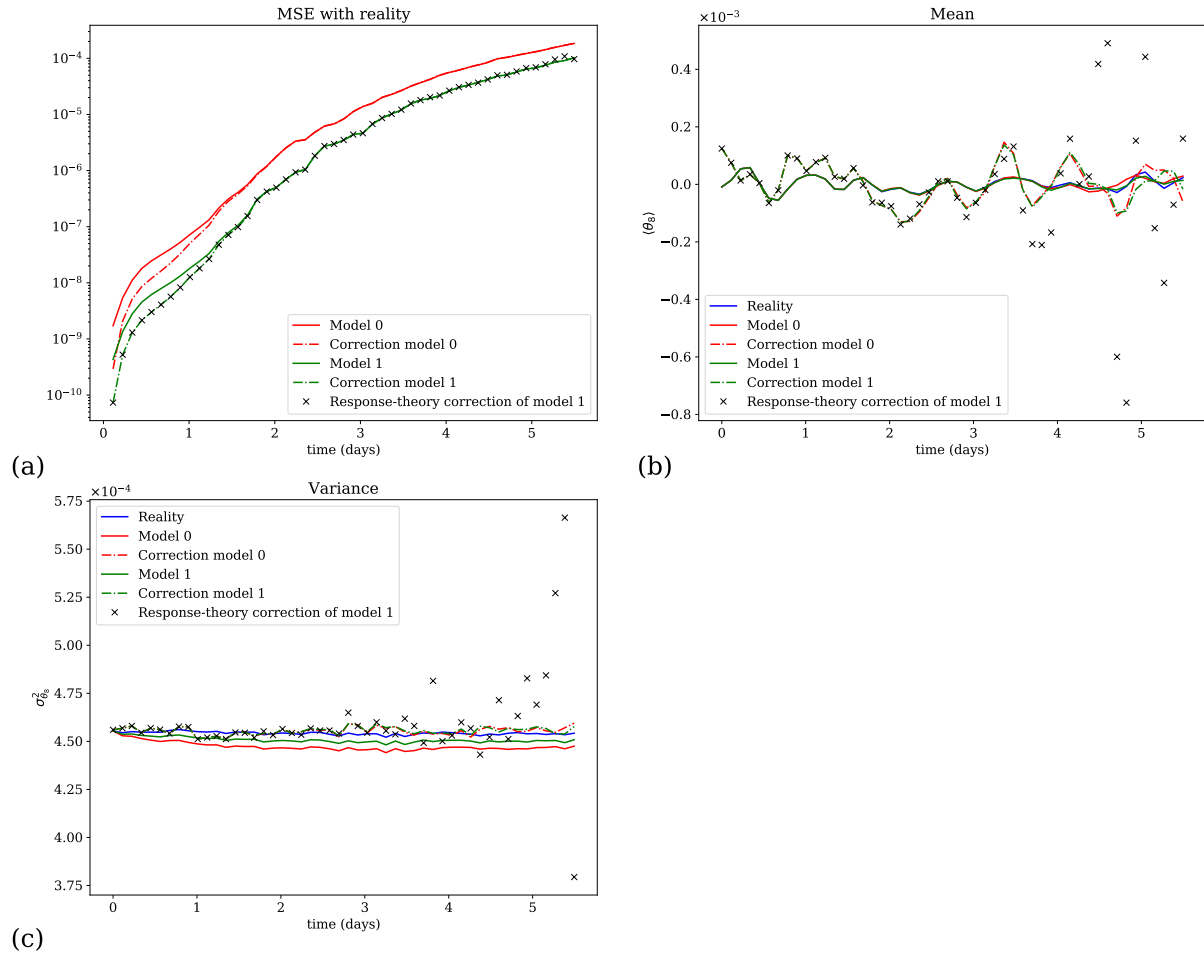


2.18 Variable θ_8

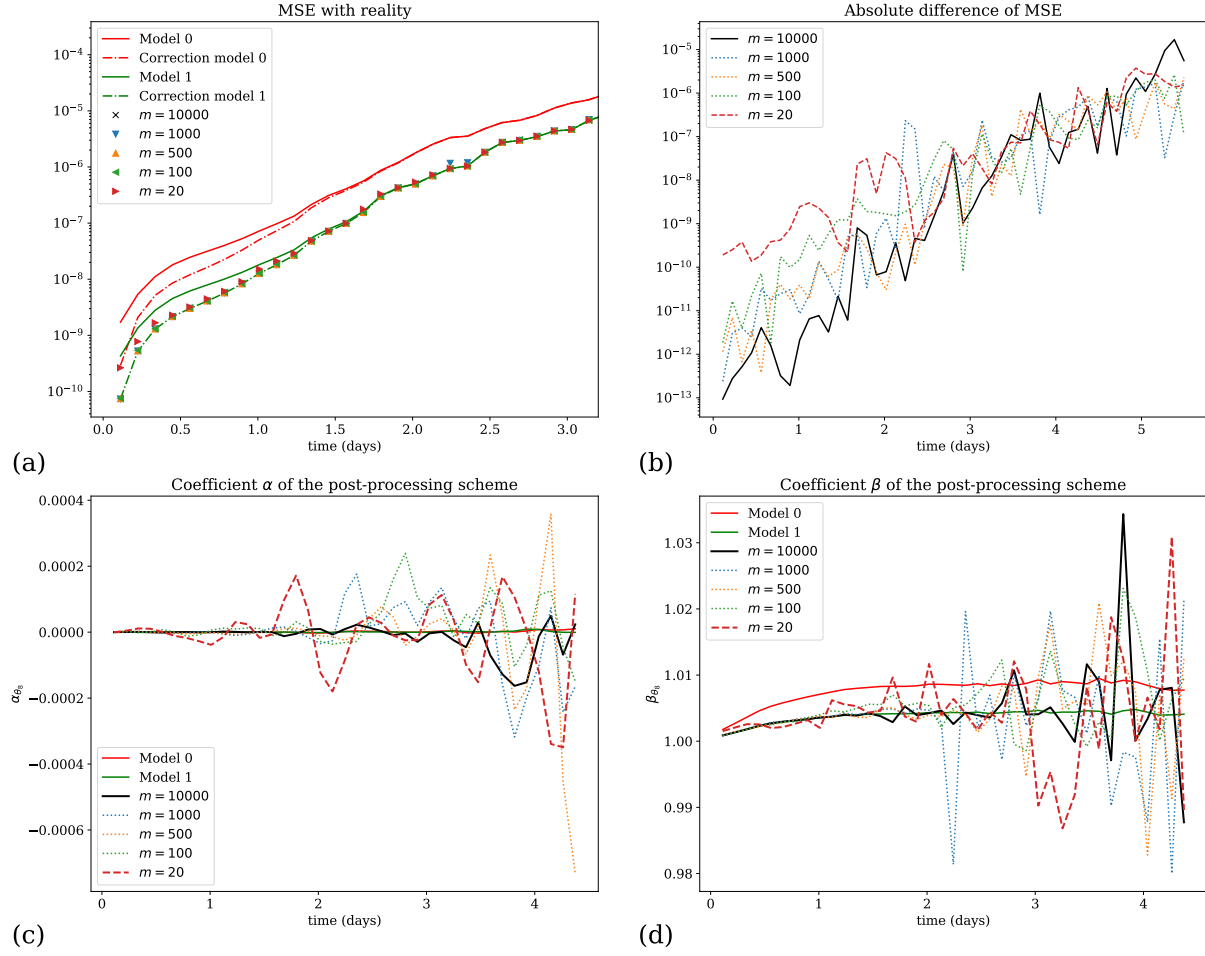
2.18.1 Corrections of the moments of the variable



2.18.2 Performance of the correction

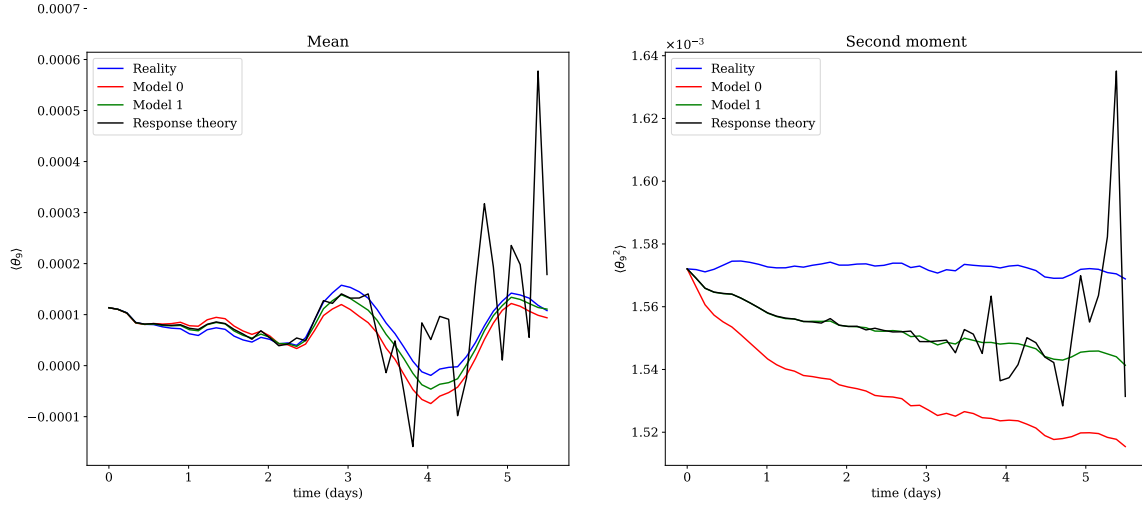


2.18.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

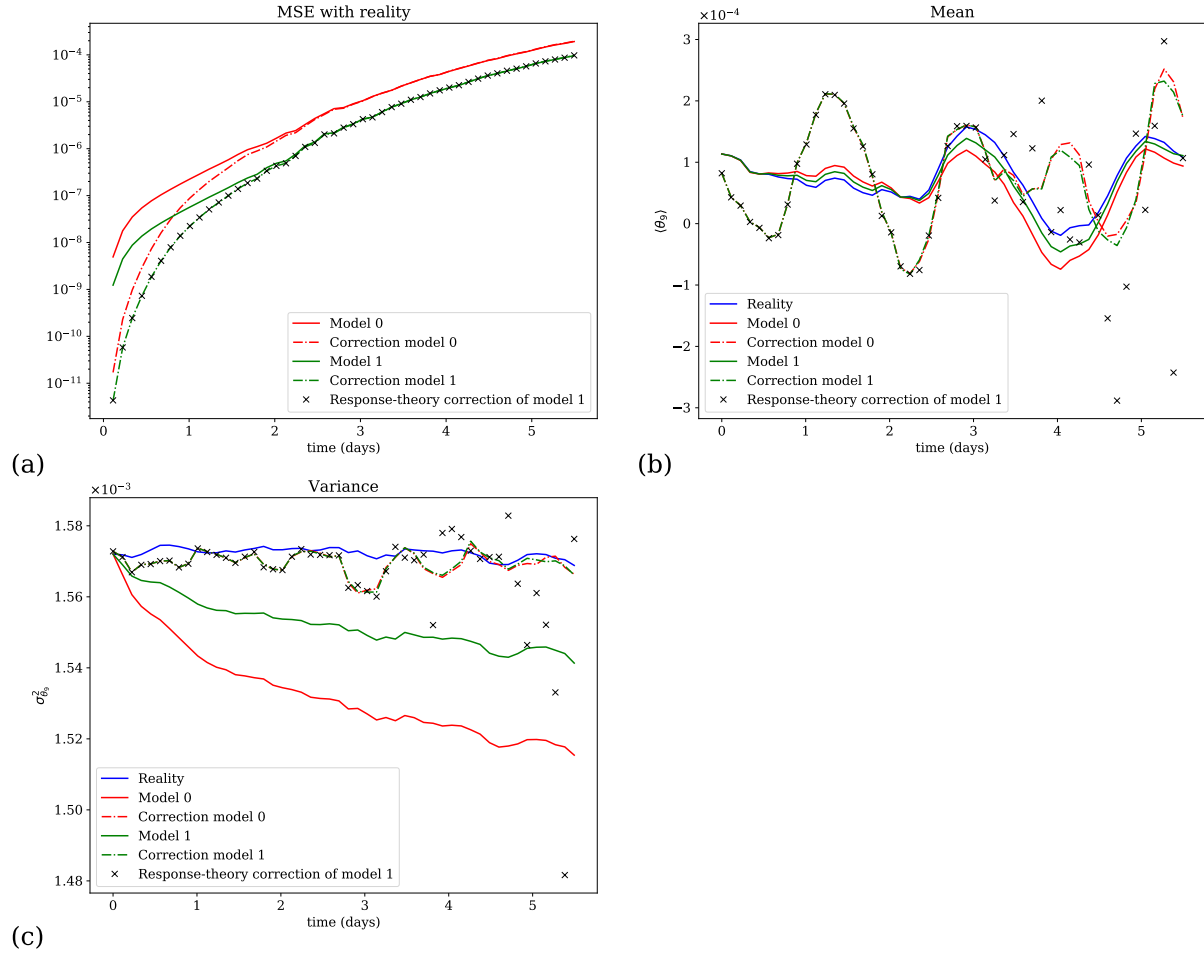


2.19 Variable θ_9

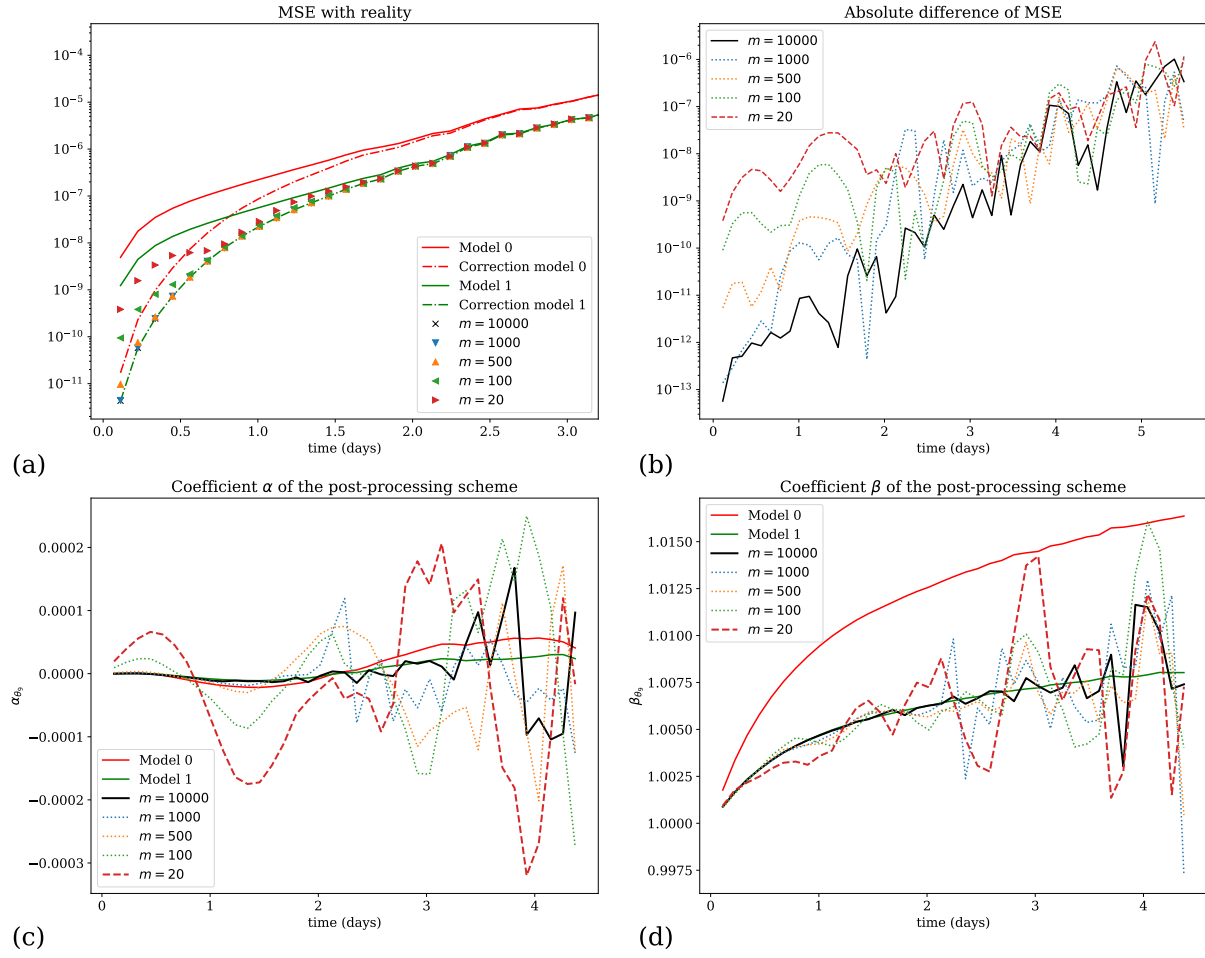
2.19.1 Corrections of the moments of the variable



2.19.2 Performance of the correction

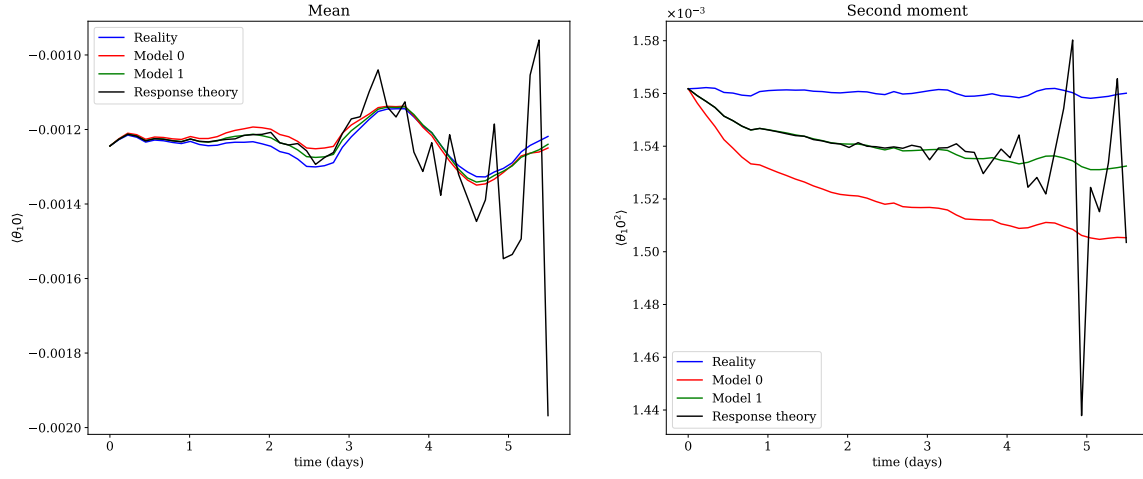


2.19.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

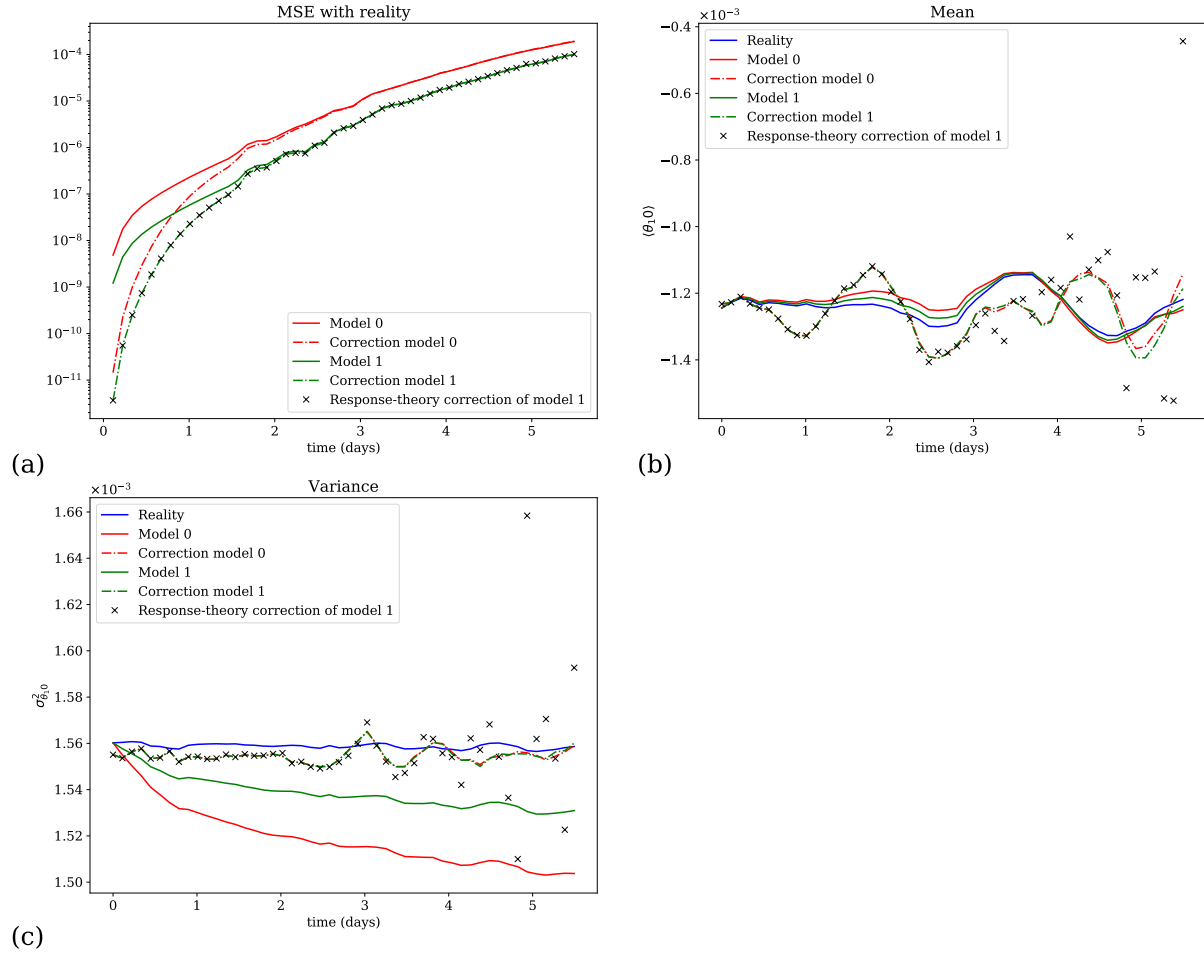


2.20 Variable θ_{10}

2.20.1 Corrections of the moments of the variable



2.20.2 Performance of the correction



2.20.3 Comparison of the efficiency of the response theory correction for different numbers m of trajectories

