I have had a quick look at the paper, and I have noted as Editor several points that will in my opinion need to be dealt with.

1. It is necessary to mention the numerical dimensions of the model CoLM, as well as to give basic information as to what it exactly simulates (state variables, main represented physical processes, …)
2. It is necessary to mention the dimensions of the control vector p. It contains sand and clay contents of the soil. But is there only one couple of values, or one couple at each of a number of gridpoints (if yes, how many ?), or what ?
3. The observation set $\{o_i\}$ (eqs 9 and 10) contain quantities which, from what I understand, are expressed in different physical units (see lines 301-305). Are these quantities normalized so as to make them nondimensional and comparable? If yes, how ? If not, the results are unit-dependent, and meaningless.
4. The results of the various minimisations, and especially the minimizing values of the objective and reference functions (tables 2, 4, …) cannot be interpreted if they are not associated with one or several physical measures of the gain obtained through the minimisation. That must be done in terms of quantities such as water content of the soil, precipitation … (but that of course depends on what the model CoLM exactly does).
5. The problem studied by the authors, which they numerically solve with the 'extended CNOP-P' method, is the same problem that is studied in the widely known *variational assimilation*. It is applied here to the identification of 'physical parameters' rather than 'state variables'. And difference with the standard form of variational assimilation is that the minimization is performed through a genetic algorithm (the *DE* method) rather than through a gradient method using the adjoint of the dynamical model. But that is technical, and it must be clearly stated from the start that the problem that is studied is the same as in variational assimilation.