Interactive comment on "Slow strain waves in blocky geological media from GPS and seismological observations on the Amurian plate" by Victor G. Bykov and Sergei V. Trofimenko

Anonymous Referee #2

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Review of manuscript: Slow strain waves in blocky geological media from GPS and seismological observations on the Amurian plate V.G. Bykov and S.V. Trofimenko submitted for publication in "Nonlinear processes in geophysics"

General comments

The paper describes a study of earthquake epicenter migrations and GPS coordinate variations in application to the problem of slow strain waves in the lithosphere. As the data, the authors used the catalog of seismic events around the northern boundary of the Amurian plate and GPS data in the two observation points. It was obtained that the average displacement rate of the weak seismicity maxima in the studied region is about 2.7 km/day (∼1000 km/yr), which is significantly higher than the velocity of slow strain

waves (10-100 km/yr) reported in other papers. The main novel part of the article (in comparison with the previous publications of the authors) is devoted to analysis of GPS coordinate variations in time. A model based on sine-Gordon equation is suggested for explanation of the GPS data analysis results.

Specific comments and questions

1. The part 4 (Seismic effects of slow strain waves. . .) looks as a brief description of the previous papers of the same authors. I suggest to add a reference to the authors' paper published in Journal of Seismology, most of arising questions were clarified there. 2. The method used by authors to estimate the rate of earthquake epicenter migrations is not suitable for estimation of the values of displacements per day, it is far beyond the approximation accuracy. So, I suppose that authors should use values in km/year, not km/day. 3. It is not clear from the article text, how the graphs in Fig.5 were obtained from the data shown in Fig.3? Why the line in Fig.3a is called "sinusoid" while the line in Fig.3c is treated as "appreciably different from a sinusoid"? 4. The "pendulum" model suggested in the paper looks very artificial. It is unclear from the text, if the authors made the calculation for such a "pendulum" oscillations of tectonic blocks or just took one of the solutions of the sine-Gordon equation. If the calculations were made – what parameters were used?

Conclusion

I recommend to accept the paper for publication with minor corrections in accordance with the above comments.