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**Title:** *“Use of a semi-linear method to predict the impact corridor on ground”*

**Abstract.** We propose an adaptation of the semi-linear algorithm [1,2] for the prediction of the impact corridor on ground of an Earth impacting asteroid. The algorithm starts from a least squares orbit, for which an impact on Earth is possible at some epoch in the future, with a positive impact probability  $IP > 0$ , as provided by the main impact monitoring systems CLOMON2 and Sentry, respectively at the university of Pisa and at NASA-JPL [3]. Since the IP is greater than zero, there exist sets of orbital parameters compatible with the least squares solution and leading to an impact. Starting from one of them and using the covariance of the least squares solution, the semi-linear method provides the boundary of the impact corridor on ground, corresponding to the piece of the initial uncertainty region that leads to the impact.

#### **References**

- [1] Milani A. (1999) *Icarus*, 137, 269–292.
- [2] Milani A. and Gronchi G. F. (2010), *Theory of Orbit Determination*, Cambridge University Press.
- [3] Milani A. et al. (2005) *Icarus*, 173, 362–384.