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# Imminent impactors

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## Résumé

The adjustment of an orbital model of motion to astrometric observations by the least-square method (or similar) is the usual method to get a realistic orbit of Solar System Objects. The precision of this model is highly dependant on the length of orbital arc corresponding to these observations. But the length of arc is sometime not long enough for Near-Earth asteroids.

Short-arc orbit determination is crucial when an asteroid is firstly discovered, or every time few observations only are available. In both cases we don’t have enough observations to compute an orbit and the standard differential correction procedure to find a least-square orbit fails. If the asteroid has also the probability to impact the Earth, it is called an imminent impactor.

I will present the methods used to deal with this kind of problems, and we will work on two well known cases, namely 2008 TC3 and 2014 AA, two asteroids discovered a few hours before their impact with the Earth. We will use this two cases to understand the main steps that need to be done to discover and characterize those objects.

If I have enough time, we will work together on the Gaia alerts, that is to the system dedicated to detect those asteroids that are possible discoveries of the ESA Gaia mission, learning how to choose the objects from the alerts that can be observed from a given observatory.

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