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Title: *"Asteroid Deflection with Safe Harbors Found via Numerical Optimization"*

Abstract. Deflection is perhaps the best option for mitigation of the danger presented by a hazardous asteroid. Deflection experiments (e.g. AIDA) are also being considered in advance of an actual hazard. If it were feasible to "safely park" the asteroid in a region of phase space that does not yield a significant future impact risk (i.e. a "safe harbor") with the Earth, this should certainly be done. In this work a metaheuristic method is used to optimize all of the relevant mission parameters for a spacecraft to deflect an asteroid via impact. The objective of the numerical optimizer is to maximize the deflection obtained while assuring that subsequent close approach distances of the asteroid to the Earth are only increased by the initial deflection.

Joint work with Siegfried Eggl and Daniel Hestroffer, IMCCE, Observatoire de Paris.