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NEOShield Kinetic Impactor Demonstration Mission

Michael Kersten⁽¹⁾, Albert Falke⁽¹⁾ and the NEOShield Consortium
⁽¹⁾*Airbus DS GmbH, 88039 Friedrichshafen, Germany, +49 7545 8 4659,*

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ABSTRACT

In 2011 the European Commission issued a call for proposals, as part of its seventh research Framework Program (FP7), for projects to address the near-Earth object (NEO) impact hazard and feasible mitigation measures. The NEOShield project, proposed by a consortium of 13 partner organizations from academia and industry, received funding for 3.5 years from January 2012. In the frame of this project amongst other things a trade-off study of different deflection techniques has been performed, and detailed designs of deflection test missions have been elaborated. One of the most promising deflection techniques uses a Kinetic Impactor, i.e. a spacecraft acting as a hypervelocity projectile that is guided on a collision course towards its target NEO in order to change the momentum of the latter. In the course of the NEOShield project Airbus DS (with staff from G, F and UK) and DEIMOS Space have developed together with the support of further consortium partners a mission and spacecraft design for a realistic Kinetic Impactor demonstration mission. The proposed mission concept comprises an Impactor spacecraft and a reconnaissance spacecraft. The latter is used for NEO characterization, impact observation and precise NEO orbit determination before and after the impact. We report on the target selection for this demonstration mission, on the selection of the mission scenario as well as on the design of the mission and of the two spacecraft.
