**5th IAA Planetary Defense Conference – PDC 2017**
**15-19 May 2017, Tokyo, Japan**

**IAA-PDC-17-0X-XX**

# A Concept of Hazardous NEO Detection and Impact Warning System

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***Keywords:*** *Hazardous NEO, early detection, AEP, orbit estimation, impact warning*

This paper addresses on a concept of hazardous NEO detection and impact warning system utilizing a space telescope. In this concept, the space telescope observes near-Earth region from deep space and detects NEOs in-coming to Earth, estimate the impacting area and raise alarm to evacuate before the impact.

In 2013, the well-known Chelyabinsk meteor entered the Earth's atmosphere over Chelyabinsk, Russia, and exploded at roughly 20 kilo-meters above the Earth's surface, which damaged the buildings and injured residents. The estimated size of NEO is only 20 meters. Because of the size and in-coming direction from the Sun, the Chelyabinsk meteor could not be detected until its impact from the ground-based observatories. Considering such situations, this concept focuses on the detection of Chelyabinsk-class small NEOs which are hardly discovered before the Earth impacts. The destructions caused by such small size NEOs are limited, however it has potential to injure many people, and in the worst case, it could take human lives. The concept aims to construct an early detection and impact warning system, in the same manner of "Tsunami" warning.

To achieve the mission objective, Artificial, Equilibrium Point, AEP is assumed to be used as the space telescope installation point in this study. AEP is literally artificially equilibrated point by Sun and Earth gravity, centrifugal force and low-thrust acceleration. The magnitude of the acceleration to keep AEP is sufficiently small near 1 au radius orbit around the Sun i.e., the order of $\mu m/s^2$ which can be achieved by solar sail. Through some cases of numerical simulations considering the size of NEOs and detector capability, this paper will reveal the feasibility of the proposed concept.