CHARACTERIZING DATA QUALITY FOR ENHANCING ORBITAL DEBRIS VISUALIZATION PIPELINES

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ABSTRACT

Orbit prediction, an essential aspect of collision avoidance is reliant upon data retrieved from space and earth-based sensors, which is then programmatically retrieved, aggregated, analyzed, processed, and visualized. While such data pipelines often treat retrieved data equally, there is a great deal of variation in the quality of the retrieved data which impacts the orbit calculations in various ways. We analyze six years of nightly data downloads (2018-2023) retrieved from the Joint Space Operations Command (JSpOC) and characterize it with respect to various characteristics including its age (time since retrieval), frequency of observations for individual objects, changes to observed objects, data formats, and object count in each download.

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$$T_S = \frac{T_b}{1 + \left(\lambda^{T_b}/\alpha\right)\ln\varepsilon} \tag{1}$$

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Figure 1. Space Debris 2009

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9.1 Sample References

1. Smith, J.M., Adams, B.A. & Wilson, A. (2002). The Future for Asteroid Exploration. *Planet. Space Sci.* **285**(11), 123-126.

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3. Svalgaard, L. & LeSager, P. (2003). What Heliosesimology Teaches us About the Sun. In *Proc. 4th. ISCS 'Solar Variability as an Input to the Earth's Environment'* (Eds. H. Lacoste & H. Xerxes), ESA SP-535 (CD-ROM), ESA Publications Division, European Space Agency, Noordwijk, The Netherlands.

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