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MODELLING A SPACE COMMODITIES EXCHANGE

Abstract

With the dawn of commercial space, the number of actors will increase above the Kármán line. To initiate space commerce, exchanges are needed to ensure secure and high throughput trade of commodities. While there are small ventures focused exchanging resources for re-fueling satellites with earth-based deliveries, supplying moon bases with commodities, and out to forward-ordering minerals from asteroids to manufacturing in space, these are centralized services that are single points of failure while having massive cyber security concerns. In addition, the harshness and distances associated with the space environment may not necessarily ensure reliability of transaction data and governance of that data to one single source of truth. In this paper we propose, a decentralized space commodities exchange using a tokenized approach for critical resources in Lower Earth Orbit with a long-term focus on the Moon, Asteroids and beyond. We develop a basic model specification of the exchange based on existing decentralized exchanges, define a baseline market, its mechanisms and token associated with the exchange. We use historical transactional data from existing exchanges to simulate the modelled market and mechanisms for our exchange. We conclude the paper discussing the return on investment for the common actor that participates on the exchange, fees rewarded for liquidity providers and finally recommendations and future work on the model and implementation of the exchange.