LUNAR ORBIT SMALL SATELLITE ARRAY FOR AN INTERFEROMETRIC RADIO TELESCOPE

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To use a constellation of small satellites is a new way of doing science in space. It is also recommended by COSPAR at its Road map of small satellite for space science in 2019. However, due to the limited resources of small satellite, the usual way of those kind of constellation is just put a cluster of micro-satellites and let them to fly freely with no control of their orbits.

The “Hongmeng Plan” (Discovering the Sky at the Longest Wavelength, DSL) is a small satellite constellation flying in the lunar orbit. It is the first time to measure such low frequency band with an array of small satellites. One of its ambiguous scientific objectives is to obtain a high resolution survey of the universe’s dark age. The small satellites will fly in the same orbit as a liner array and taking interferometric measurement between any two of them. The distances between the small satellites are not evenly distributed but with careful design and with limited control during the mission operation. With that, the visibility function measurements will reach a good coverage on the UV plan and help to retrieve a good image. Measurements will be taken while the array is on the far side of the Moon taking the advantage of the radio quietness and transmit data while it is on the near side.

DSL is still a proposal however it is likely to be approved soon and aiming to be launch in 2028.