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ポスター 2 ：9/25　AM1/AM2 （9:00-12:30）

月面天文台：メートル波電波干渉計の概念検討

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A Conceptual Study on Meter-wave Radio Interferometer: Lunar Astronomical Observatory

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Since high-precision observation in the lower frequency range below 10 MHz has not yet been realized, this frequency range is notable as one of the last frontiers for astronomy. This is because the terrestrial ionosphere prevents ground-based observations of radio waves below the ionospheric cutoff. While spacecraft have been used to observe radio waves below 10 MHz, low-frequency radio waves require longer antenna elements, making it difficult to increase the aperture size of radio antennas mounted on a spacecraft. It is also difficult to observe the faint radio waves from planets and celestial objects even in Earth orbit because of interference from solar flares, artificial radio broadcasts, and terrestrial auroral radio emissions. The far side of the Moon is a suitable location for such low-frequency astronomical observations because radio waves from the Earth can always be avoided and radio waves from the Sun can be shielded during the lunar night. One of the major goals of astronomy on the far side of the Moon is the first detection of the 21 cm neutral hydrogen absorption line from the Dark Ages of the universe. Another goal is the radio emission from the central stars with habitable planets and the radio emission from exoplanets, which would provide us with space weather environments of exoplanets and intrinsic parameters of exoplanets such as magnetic field strength, rotation rate, and so on. We report the progress of a conceptual study on a lunar astronomical observatory consisting of a meter-wave radio interferometer on the far side of the Moon. This observatory aims at more than 100 antennas extended to a maximum baseline of more than 100 km, providing a spatial resolution of about 1 arcmin at 10 MHz. We will report on the feasibility study of the first stage pilot probe with three antenna units and scientific observations with the pilot probe including the lunar environment.