Very low frequency interferometry for the Chang'E-2 Project

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China's space exploration program to the moon, the Chang'E Mission, is envisaged to have three phases: the lunar orbiter (Chang'E-1) phase, the lander-rover phase (Chang'E-2), and the sample return phase. The lander-rover phase will deploy a platform and a rover to conduct scientific experiments on lunar surface with a number of objectives. The platform will land on the moon with the rover. The rover is expected to travel with its onboard instruments and could be separated from the platform by a distance of several kilometers. There may also be an orbiter for the second phase. An astronomical experiment in the very low frequency (VLF, $f < 15$MHz) regime proposed for the Chang'E-2 phase has been accepted for further study. It is expected to put one element on the platform and the other on the rover or the orbiter to form an interferometer. Because of the Earth's ionosphere it is practically impossible to conduct ground-based study of VLF radiation coming from space. Observations in VLF regime are important for space weather studies, i.e., to monitor the type III and type II bursts from the Sun, which are prompt indicators of energetic electron beams and shock propagations that may be associated with the flare and coronal mass ejection processes. Furthermore, the goals include observing Auroral Kilometric Radiation, and planetary radiation in the solar system, studying the origin of Cosmic Rays, spectral properties of pulsars, surveying ionized hydrogen in the Galaxy, and exploring coherent radio emissions. It may achieve degree-level spatial resolution. Here we present simulated simplified observing scenario to demonstrate the main performance of the VLF interferometer.