

Positioning of Reflectors on Lunar Surface for Discriminating from Subsurface Echoes : Computer Simulations on SELENE LRS Mission

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In LRS observatins purposed to investigate Lunar subsurface in the high land region, the discrimination of subsurface echoes among anticipated echoes, from the crowded craters on the lunar surface, is required. Usage of the dipole antenna makes the direction of surface echoes arriving not simply determined ; the problem is solved by applying the Doppler Beam Sharpening method that belongs to the same category as SAR data analyses methods. Due to the pulse length of 200micro sec the possible Doppler shift frequency of 37Hz at the largest cannot be detected during a single pulse observation. Therefore, temporal variations of phases of received echo signals are measured to determin Doppler frequency for each range bin; computer simulations were carried out to verify the methodology.