

SPACE DEBRIS SYMPOSIUM (A6)
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SATELLITE ORBIT DETERMINATIONS WITH ANGLE-ONLY DATA USING 0.6M OPTICAL
WIDE-FIELD TELESCOPE IN KASI**Abstract**

We observed 5 satellites (2 MEO, 1 GEO and 1 obsolete) using an optical observation system with a 0.6m wide-field telescope in KASI (Korean Astronomy and Space Science Institute). The optics has a f-ratio of 2.92 and is capable of viewing 4 square-degree fields at the prime focus. The mount system has a maximum speed of 10 degree/sec. Observations are carried out during 23 nights. A large parts of errors is caused by targeting, expose start time and end-point determination. For coordinate correction, we used WCS (World Coordinate System) solution with GSC 1.1 catalogue, and finally reduced the errors by 13 arc seconds. We found that an obsolete satellite has brightness variation which continues for 4 minutes in every 16 minutes. Gauss method for initial orbit determination was tested using angle-only data simulated by KODAS(KASI Orbit Determination and Analysis System). We also founded that from 2 to 5 minutes time span is confirmed for result which has minimum errors. Initial orbit determination are proved that optical observation system in KASI can be used satellite tracking for 2 or 3 hours. And also through differential correction using f & g series, initial orbit determination results are improved. From our optical observation, we confirmed that the precise orbit determination need optical telescope system with narrow FOV(field of view), efficient algorithm for reducing errors, more effective initial orbit determination software for optical observation and cooperation with other observation system like SLR(satellite laser ranging).