

SPACE DEBRIS SYMPOSIUM (A6)  
Measurements (1)

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FEASIBILITY OF USING THE INSTRUMENTATION RADARS AT OTB TO DETECT AND TRACK  
SPACE DEBRIS**Abstract**

In July 2009 the Secure World Foundation (SWF) contracted the South African National Research Foundation (NRF) to perform a pilot study to establish whether the existing test range instrumentation radars at OTB, a division of Denel (Pty) Ltd at Arniston, near Cape Town, South Africa, could be used to detect and track space debris. The NRF in turn contracted OTB to perform the necessary theoretical and practical work for a pilot study and produce a report. This paper reports for the first time on this work.

Some high-level considerations for the detection and tracking of space debris by means of radar are given. Relevant specifications of the OTB instrumentation radars were used in order to get an idea of a possible range of application of the OTB radars in the field of space debris acquisition, detection and tracking.

Several test observations were done on cataloged objects for which good orbital predictions were available and that would present sufficiently large radar cross-sections. Practical problems were experienced and process adjustments were made to mitigate or eliminate them. In the end sufficient measurements could be done to demonstrate that the OTB instrumentation radars in their current configuration could, with some effort, be used to detect and possibly track suitably sized objects in low earth orbit.

Possible software and hardware improvements to the OTB instrumentation radars are suggested that would facilitate using these radars for the routine detection and tracking of space debris, and the participation in future re-entry observing campaigns.