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**The Near Earth Object Surveillance Satellite: Mission status and CCD evolution
after 18 months on-orbit**

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The Near Earth Object Surveillance Satellite (NEOSSat) is a small telescope equipped microsatellite designed to perform both Space Situational Awareness (SSA) experiments and asteroid detection. NEOSSat was launched on 25 February 2013, however, due to time pressures, NEOSSat was launched with only the minimal software required to keep the spacecraft safe. The time pressure also resulted in the spacecraft undergoing reduced system and environmental testing on the ground.

The full software suite, required to obtain imagery and maintain stable pointing, has since been uploaded to the spacecraft. NEOSSat has obtained imagery since June 2013, with the shutter both open and closed, but as of March 2014 has not achieved the fine pointing required to obtain scientifically useful data.

The collected imagery is being used to characterize the on-board CCD camera. While gain and dark current values agree with pre-launch values, unexpected artefacts have appeared in the images. Methods for mitigating the artefacts through image processing have been developed, and spacecraft-level fixes are currently being investigated.

In addition, damage from high energy particles impacting the CCD has produced “hot pixels” in imagery. We have been able to measure the evolution of these hot pixels over several months, both in terms of numbers and characteristics; these results will be presented. In addition, early results from the mission (image quality issues and evolution, early imagery examples), as well as the mission status (including fine pointing), will be discussed.

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Dr. Wallace is a Defence Scientist for Defence R&D Canada–Ottawa’s Space Systems and Operations Group. He has worked on both ground and space-based SSA systems, and is the Principle Investigator of NEOSSat’s SSA research mission. He has a Ph.D. in astrophysics from the University of Calgary, Canada, and worked in radio astronomy at the National Research Council of Canada and the Smithsonian Astrophysical Observatory before joining DRDC.

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