

EARTH OBSERVATION SYMPOSIUM (B1)  
Future Earth Observation Systems (2)

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NEMO-HD: A HIGH PERFORMANCE MULTISPECTRAL EARTH OBSERVATION  
MICROSATELLITE ENABLED BY COTS COMPONENTS**Abstract**

NEMO-HD is a high performance multispectral earth-observation microsatellite currently in development by the University of Toronto Institute for Aerospace Studies – Space Flight Laboratory (UTIAS – SFL) for the Slovenian Centre of Excellence for Space Sciences and Technologies (Space-SI). The NEMO-HD payload consists of two instruments: The primary instrument is capable of imaging in four spectral bands at a GSD of 2.8 m, and covers a swath width of 10 km. The secondary instrument produces images at a GSD of 40 m and a much wider field of view. In addition to still imaging, both primary and secondary instruments capture high definition video at 25 frames per second. The video is H.264 encoded and downlinked in real time. Commercial off-the-shelf electronic assemblies are used extensively throughout the payload to capture, store, and downlink the vast quantities of data generated, and to perform real-time video encoding. Their use has facilitated substantial reductions to development costs, and has allowed the

demanding timelines of the NEMO-HD mission to be met. Furthermore, embracing of industry accepted protocols and open source software has drastically reduced the required software development efforts, and allowed the use of readily available tools for development, testing, and debugging. This paper discusses how the use of commercial off-the-shelf hardware and open source software has enabled the design and development of a high performance multi-spectral earth observation instrument. In addition, an overview of the NEMO-HD mission and spacecraft are also provided.