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MRES: A MEDIUM RESOLUTION MAPPING SATELLITE SYSTEM FOR THE REPUBLIC OF
KAZAKHSTAN**Abstract**

The Republic of Kazakhstan is leveraging the advances in Small Satellite Earth Observation capability to create a national system which supports the government with information gathering for its policy and decision making. It will be implemented by a team comprising EADS Astrium and SSTL, and will include a high resolution mapping spacecraft and a wide-swath medium resolution multispectral mapping spacecraft. The project was initiated in late 2009, and is the first collaboration between SSTL and Astrium since its ownership change. It highlights how small satellites can be employed in complex satellite systems to complement larger spacecraft.

The Medium Resolution (MRES) mission will focus on delivering multispectral imagery of the Kazakh territory and other parts of the Earth. Its heritage is derived from SSTL's previously successful SSTL-150 class missions that include TopSat, DMC+4 and the RapidEye constellation of 5 spacecraft. Furthermore the Kazakhstan MRES system shall implement some key subsystems developed for SSTL's upcoming NigeriaSat-2 mission to enhance the data handling and downlink capabilities of the satellite. This includes narrow beam tracking antennas to increase data rates and data volume, improved geolocation and off-pointing capabilities, and higher data storage capacity. This results in a spacecraft that is less than 200 kg in weight, can image and downlink 1,000,000 km of image data per day and has exceptional attitude control capabilities for its class. The satellite will use the imager that was successfully flown on the RapidEye mission, and is currently due for launch in 2013.

This paper aims to describe the space programme of the Republic of Kazakhstan, and the MRES mission and satellite design. It will discuss the mission's heritage derived from other SSTL missions, and discuss areas where the design had to be improved to meet the challenging mission requirements.