

SYMPOSIUM ON TECHNOLOGICAL REQUIREMENTS FOR FUTURE SPACE ASTRONOMY AND  
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Technology Needs (Part 1) (1)

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THE CHINESE SPACE MILLIMETER-WAVELENGTH VLBI ARRAY - A STEP TOWARD IMAGING  
THE MOST COMPACT ASTRONOMICAL OBJECTS

**Abstract**

The Shanghai Astronomical Observatory (SHAO) of the Chinese Academy of Sciences (CAS) is studying a space VLBI (Very Long Baseline Interferometer) program. The primary objective of the program is ultrahigh angular resolution imaging of the immediate vicinity of the supermassive black holes in the hearts of galaxies. The strategy of the mission is designed into three phases leading ultimately to sub-millimeter VLBI capability. The first phase of the program is the Space Millimeter-wavelength VLBI Array (SMVA) consisting of two satellites into elliptical orbits with apogee of 60000 km and perigee of 1200 kilometer. This first VLBI array in the space will have two 10 meter radio telescopes working at three frequency bands, 43, 22 and 8 GHz. The 43 and 22 GHz bands are equipped with cryogenic receivers. The space telescopes will observe together with an array of ground-based radio telescopes. The maximum angular resolution at 43 GHz is 20 micro-arcsecond. The SMVA is expected to conduct a variety of high-resolution observational researches, e.g. the imaging of the black hole shadow of M87, studying water megamaser kinematics, and exploring the power source of active galactic nuclei. Pre-research funding by CAS for scientific and technical feasibility studies was initiated in October 2012. This study also includes the manufacturing of a prototype of deployable 10-meter telescope and a K-band (22GHz) receiver. We will present the latest progress on the SMVA project.