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Microwave Observations of Intra-day Variability of Quasars by Students Participating in the GAVRT Science Education Partnership

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Intra-day variability (IDV) of active galactic nuclei has been detected from gamma-ray energies to radio wavelengths. At very high frequencies, the variability appears to be intrinsic to the source, but at radio wavelengths the principal mechanism appears to be interstellar scintillations. Microwave observations of IDV in radio-bright quasars are now being carried out by students in middle schools and high schools located across the United States. These students and their teachers are participants in the Goldstone-Apple Valley Radio Telescope (GAVRT) science education partnership sponsored by the National Aeronautics and Space Administration, the Jet Propulsion Laboratory (JPL) and the Lewis Center for Educational Research (LCER) in Apple Valley, California.

The GAVRT partnership supports several curriculum based projects that now include studies of the IDV radio sources. The partnership enables students to remotely control the GAVRT radio telescope from their classrooms via the internet. The radio telescope is a 34-m antenna located at NASA's Goldstone Deep Space Communications Complex in the Mojave Desert in California. The GAVRT antenna is equipped with dual-frequency cooled receivers operating at 2292 MHz and 8480 MHz. The GAVRT team is preparing to conduct microwave observing campaigns designed to measure the flux densities of selected IDV Quasars with a statistical precision of at least +/- 3 percent for sources brighter than 500 mJy. This new curriculum-based project, identified as the GAVRT Quasar Variability Study (GAVRT-QVS) is scheduled to begin in the spring of 2003. In this paper the authors will describe the project and report the preliminary results of the first GAVRT-QVS observing campaign.

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