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Microwave observations of Jupiter's Synchrotron Emission during the Galileo flyby of Amalthea in 2002.

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In November, 2002, the Galileo spacecraft trajectory provided a close flyby of Amalthea, one of Jupiter's inner most moons (~2.4 RJ). During this pass, Galileo entered into a region rarely explored by spacecraft, the inner radiation belts of Jupiter. We present preliminary results from a campaign of microwave observations of Jovian synchrotron emission over a six month interval centered around the flyby. The observations were made with NASA's Deep Space Network (DSN) antennas at Goldstone, California, and the NRAO Very Large Array. We report preliminary measurements of the flux density of the synchrotron emission and the rotational beaming curves and a compare them with the long term history of Jupiter's microwave emission which varies significantly on timescales of months to years. The new data are also being examined to search for evidence of short-term variations and to compare single aperture beaming curves with the spatially resolved images obtained with the VLA. These radio astronomy data will be combined with in-situ measurements from Galileo (see companion paper by Bolton et al) to improve models of the synchrotron emission from Jupiter's radiation belts.

A large percentage of the Goldstone observations were conducted by middle- and high school students from classrooms across the nation. The students and their teachers are participants in the Goldstone-Apple Valley Radio Telescope (GAVRT) science education project, which is a partnership involving NASA, the Jet Propulsion Laboratory and the Lewis Center for Educational Research (LCER) in Apple Valley, CA. Working with the Lewis Center over the Internet, GAVRT students conduct remotely controlled radio astronomy observations using 34-m antennas at Goldstone.

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