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Milagro Observations of the TeV Sky

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The Milagro air shower array in the Jemez mountains above Los Alamos was decommissioned in June 2008 after four years of operation at full sensitivity. The central Milagro 80x60 meter water pond was instrumented with 723 Photo-multiplier Tubes and was operated since 1999. In 2004 an array of 176 outrigger water tanks, each hosting a single PMT, was added, completing the detector. Milagro was the first experiment to use water-Cherenkov technology to measure astrophysical TeV gamma rays and complements IACT observations with its large duty factor and wide field of view. The Milagro Collaboration has previously announced discovery of new discrete TeV gamma-ray sources and measurement of diffuse TeV fluxes from the Galactic plane and the Cygnus region of the galaxy. The final analysis of the full Milagro dataset will be presented, focusing on the measured energy spectra of Milagro gamma-ray sources. Two unexpected localized excesses of cosmic rays will also be shown. These cosmic-ray excesses are particularly interesting because they cannot be explained with conventional understanding of the local and galactic magnetic fields and may suggest the presence of a nearby accelerator. Finally these observations will be discussed in the context of the search for the origin of cosmic rays.

¹For the Milagro Collaboration