

Status Report for the Keck/Solar Two Gamma Ray Observatory

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There is strong interest in the rapidly growing gamma-ray astrophysics community to make sensitive observations in the unexplored 20-300 GeV energy range which is largely inaccessible to present ground-based and satellite detectors. The abandoned solar power farms utilizing a central receiver surrounded by a large field of steerable mirrors provide a way to make observations below 300 GeV at a relatively small cost as shown by STACEE, CELESTE and GRAAL. The Solar Two Power Plant in Barstow, California, has more than 1,800 steerable mirrors and is an order of magnitude larger than any solar farm in the world. As such, it has the potential to be the most sensitive ground-based gamma-ray detector in the 20-300 GeV region.

Using a grant from the Keck Foundation, we have instrumented a camera, which collects light from 32 heliostats at the Solar Two site. We are using this assembly to observe the Crab Nebula, the standard candle of gamma-ray astronomy, and concurrently expanding the instrumentation to include 64 heliostats. By sampling the photon density in the Cherenkov wavefront emitted by the cosmic-ray induced particle showers, one can detect and discriminate celestial gamma rays and the more abundant hadronic background. The status of the Solar Two Gamma Ray Observatory will be presented and the test results for the first 32 heliostat telescope will be discussed.