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TITLE: The GammeV Particle Search Experiment

ABSTRACT:

We describe the GammeV experiment at Fermilab--a gamma to milli-eV particle search using a "light shining through a wall" technique. This experiment involves shining a high-power laser into a Fermilab Tevatron magnet that is blocked by a mirrored surface in its interior (the "wall"). If some photons convert into a new milli-eV particles via interactions with the magnetic field, they may pass through the mirror and some fraction may reconvert into detectable photons on the other side. The mirrored surface is attached to a moveable plunger which allows us to adjust the effective path length of the photons and hence probe for particles of slightly different masses. We describe the design, status, and plans of this experiment including our expected sensitivity in the milli-eV mass range.