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Present Status of the Neutrino Angra Project

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We will present the status of the Neutrino ANGRA project, aimed at developing an antineutrino detector for monitoring nuclear reactor activity. The Angra experiment will be deployed at the Brazilian nuclear power plant Angra II. A water Cherenkov detector of one ton target will be placed in a commercial container next to the reactor containment, about 30 m from the reactor core. The 4 GW thermal power of the Angra II reactor will provide a few thousand antineutrino inverse beta decay interactions per day. The detector will consist of three subsystems: 1) a muon veto placed in the outer most detector layer; 2) a neutron shield 30cm thick consisting of water; 3) a central detector consisting of an inner neutron shield (20cm) and a one ton central target both filled with a mixture of water and 0.2% of gadolinium. The main challenge of the experiment will be to overcome the very high cosmic ray induced background at sea level, consisting of muons, neutrons, gammas, protons, pions, positrons and electrons. We have simulated the signal and background events at the expected rates and used a Mixer program to organize them in temporal order, simulating in this way the real events in the Angra detector. We will present the analysis strategy to overcome the background and extract the number of antineutrino events.

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