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Heavy Photon Search at JLab

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The Heavy Photon Search (HPS) is an experiment held in Jefferson Laboratory to search for new heavy vector boson(s) (A') in the mass range of 20 MeV/c² to 1000 MeV/c². Such heavy photons could couple to electrons and be radiated in electron scattering before decaying into narrow e⁺ e⁻ resonances which can be observed above the QED background. The experimental setup is using a new compact, large acceptance forward spectrometer, composed of a silicon vertex tracker and a PbWO₄ electromagnetic calorimeter (ECal). The latter has been built by the IPN group. I will present the results of my studies for the ECal, in particular the most recent on the effect of geometry on the energy reconstruction. Understanding the QED background is also essential for this experiment and I will present my progress on developing a calculation adapted to our exact detector geometry.

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