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Photon-Refracting Aerogel DANIEL RICE, The Catholic University of America — A threshold aerogel Cherenkov detector is being constructed at CUA to allow for the study of kaons in experiments at the Jefferson Laboratory. These subatomic particles move faster than light through the aerogel material, emitting Cherenkov radiation. Photomultiplier Tubes (PMTs) convert the photons from the Cherenkov radiation into electrons and multiply the electrons sufficiently to get a readable electronic signal, which can be analyzed. An important part of a threshold aerogel Cherenkov detector is its use of aerogel material of several refractive indices to cover the full dynamic range over which one wants to detect the particles of interest (in this case the kaon). Uniform coverage in refractive index is important as the location of the incoming particle will not be constant throughout the testing. In addition to testing for uniform coverage, we must also verify these refractive indices to ensure that the particles we are detecting are in fact kaons. The last test on the aerogel that needs to be performed is the measurement of transparency. Although aerogel is highly transparent, it is still necessary to find the amount of light being absorbed, reflected, or scattered versus how much will actually be measured by the PMTs used.

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