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Characterization of Aerogel's Optical Properties[1] ABIGAIL JUSTEN, Trinity School at Meadow View, JONATHAN YOUNG, Northwestern University — Aerogel is used in the kaon aerogel Cerenkov detector at Jefferson Lab. Kaons are identified by the number of photons created through Cerenkov radiation emitted as the kaon travels through the aerogel. Depending on the refractive index of the aerogel, kaons of different momenta can be detected and distinguished from protons. Therefore, a uniform refractive index in the detector is important to reduce uncertainty in the Cerenkov radiation. We found the refractive index of the aerogel by shining a red construction laser through it and measuring how far the beam refracted. The refractive index of aerogel is also directly related to the density of aerogel. The humidity in the air, if absorbed, could also affect the refractive index. To test the effect of humidity on aerogel we used a humidity controlled environment between 80 and 100 percent on aerogel from Matsushita Electric Works, Ltd, Japan Fine Ceramic Center, and Novosibirsk. Finally, we tested the transmittance of aerogel tiles with a UV/Vis photospectrometer to find the correlation between transmittance and the tile's properties. Tiles with the highest transmittance will allow for the most accurate count of the photons produced through Cerenkov radiation. The results from these experiments will be presented.

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Abigail Justen
Trinity School at Meadow View

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