

Abstract Submitted
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Mass Resolution in the Search for a New Boson in the APEX Experiment¹ ERIC JENSEN, The College of William and Mary — The APEX experiment at Jefferson Lab is searching for a new vector boson A' with weak coupling to electrons in the mass range $65 \text{ MeV} < m_{A'} < 550 \text{ MeV}$. In this search for the A' , establishing the mass resolution is critically important for determining the sensitivity of the experiment. The High Resolution Spectrometers (HRS) used in the APEX experiment have an excellent relative momentum resolution. The mass resolution is therefore dominated by the angular resolution. The angular resolution is dominated by three contributions: scattering of the e^+e^- inside the target, track measurement errors by the HRS detectors, and imperfections in the magnetic optics reconstruction matrix. APEX held a three-week test run in July 2010, for which an A' search was performed in the mass range 175-250 MeV. We determined the final mass resolution of the test run to be between 0.85 and 1.11 MeV, depending on the invariant mass. This report will present a detailed account of the analysis procedure used to determine the final mass resolution.

¹For the APEX Collaboration

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