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The Effects of Using a Commercial Grade Plasma Etching Chamber to Etch Anodized Niobium Surfaces CHRISTIANA EPPERSON, DERETH DRAKE, KALINA WINSKA, Valdosta State University — Anodized niobium surfaces are used in particle accelerators for construction of the superconducting cavities. These surfaces must be cleaned regularly to remove containments and maintain the surface smoothness. The most common method used is that of chemically etching the surface using acid baths; however, this process can affect the smoothness of the layer and is extremely time consuming and hazardous. Plasma etching is one alternative that has shown great promise. We are using a commercial grade plasma etching chamber to clean anodized niobium samples that have varying oxide layer thicknesses. Spectral profiles of the surfaces of the samples are taken before and after etching. All measured results are compared to a simple theoretical model in order to determine the effects of the etching process on each surface.

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