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**Plasma Solution Quality in Distorted, Body-Fitted Meshes in HiFi/SEL** WESTON LOWRIE, University of Washington, VYACHESLAV LUKIN, Naval Research Laboratory, URI SHUMLAK, University of Washington, PLASMA SCIENCE AND INNOVATION CENTER COLLABORATION — Highly distorted meshes can yield significant errors in field solutions. Mesh metrics have been widely used to quantify distortion on computational meshes, although they rarely make strong correlations to solution accuracy. In this study several mesh quality metrics are compared to solution error norms for varying types and degrees of mesh deformation. The goal is to be able to better predict the solution error magnitudes based solely on mesh metrics. This work is done using the HiFi/SEL high-order finite (spectral) element code, which is a code that can incorporate many physics models, including the extended MHD plasma model. The code also makes use of a multiblock framework, where several structured logical blocks are coupled together into one computational domain. Each block uses a logical to physical grid transformation to deform the mesh into some physical shape of interest. This can sometimes yield highly distorted meshes, and it is important to know if a particular region of the domain is of acceptable quality.

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