DYNAMIC RESPONSE OF THICK-LIQUID SHIELDING IN Z-PINCH BASED INERTIAL FUSION ENERGY CHAMBERS*

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A major concern in the design of thick-liquid protected inertial fusion chambers of all types is the dynamic response of the shielding fluid to pulsed fusion micro-explosions. Large induced liquid speeds can stress and damage solid chamber structures such as the first wall. In a z-pinch based inertial fusion energy (Z-IFE) reaction chamber this issue becomes particularly critical due to the relatively large proposed target yields ranging from 3 to 20 GJ. In this paper we summarize an analysis of this response for the recently suggested Z-IFE shielding geometry illustrated in Figure 1. Taken into account are effects involving ablation of target facing liquid surfaces, pocket pressurization & venting, and neutron isochoric heating. The impact of varying several chamber and thick-liquid shielding parameters is also discussed.

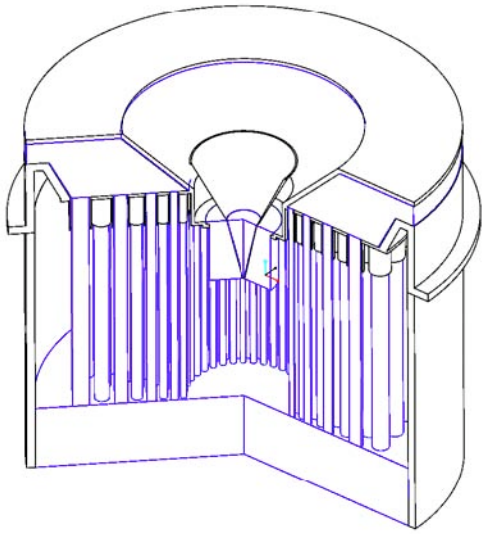

Figure 1. A rendition of a Z-IFE reaction chamber with an annular array of shielding jets.

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