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Conceptual Design for a 2 GW Inertial Fusion Energy (IFE) Direct-Drive Power Reactor Employing Magnetic Intervention[1] K.R. TRESEMER, George Fox University, C.A. GENTILE, Princeton Plasma Physics Laboratory — Presented is a conceptual design for a 2 GW IFE direct drive fusion power reactor. This design employs a cusp field to deflect IFE-generated ions away from the dry first wall of the target chamber and into specifically designed ion dumps. The reactor operates at 5 Hz, consuming ∼450,000 tritium targets/day, injected at >100 m/s into the target chamber and uniformly illuminated by laser light, stimulating detonation. The resulting fusion energy is collected by equatorial ion dumps equipped with heat exchangers. The reactor will breed and recycle its own fuel through the use of breeder blankets and a fuel recovery system. To minimize target-particle interference, the chamber will be kept at <0.5 mTorr through the use of magnetically levitated turbomolecular pumps (TMPs) and corresponding backing pumps. Under investigation are the principles of magnetohydrodynamics (MHD) which may be applied to attenuate and harness the energy residing in the post detonation ion fields.

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