Simulation of quasi spherical direct drive capsules for pulsed-power driven inertial fusion energy\textsuperscript{1} J.P. VANDEVENDER, VanDevender Enterprises, S.A. SLUTZ, R.A. VESEY, M.C. HERRMANN, D.B. SINARS, T.J. NASH, Sandia National Laboratories, N.F. RODERICK, U. of New Mexico, A.B. SEFKOW, Sandia National Laboratories — Magnetic pressure from 35-MA current in a 1-mm-radius liner is equivalent to the ablation pressure in the beryllium pusher of an inertial fusion capsule in a 300 eV hohlraum and can, in principle, drive a Quasi Spherical Direct Drive (QSDD) fusion capsule to yields of $\sim$600 MJ with a 45 MA, 40 ns pulsed power driver. Analytic theory and 1D and 2D simulations of QSDD capsules show insensitivity to magnetic Rayleigh-Taylor instability, internal pulse shaping, efficient compression of cryogenic fuel on a low ($\alpha$=1.5) adiabat, hot spot heating, current diffusion into the hot spot with alpha trapping, and burn. However, practical QSDD capsules require a large rate of change of current $dI/dt \sim$1.5 MA/ns and are susceptible to a wall instability, which must be further mitigated.

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