Corrections to Energy Conservation When Including Density Variation in 2-Fluid Models[1] SAGE STANISH, SASKIA MORDIJCK, William Mary, BENJAMIN DUDSON, University of York — Conservation of energy in 2-fluid turbulence models is important for capturing the correct balance of sources and sinks, and improves numerical stability. Most 2-fluid drift-reduced models rely on the Boussinesq approximation for the plasma density, effectively neglecting any perpendicular density gradients in the divergence of polarization current. This approximation is violated especially at the plasma edge in magnetically confinement devices where very large density gradients can be observed. In this poster we will study the impact of introducing a perpendicular dependence of the plasma density on energy conservation, and energy transfer channels . We will assess the impact of these new terms and include them in the Hermes 2-fluid model, a 3D hot-ion turbulence code based on BOUT++.

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