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Two-fluid modifications on the Kelvin-Helmholtz instability in a Tokamak Plasma OMAR LOPEZ ORTIZ, LUCA GUAZZOTTO, Auburn Univ — In a two-fluid magnetohydrodynamical description of axisymmetric equilibria stream surfaces do not exactly overlap with flux surfaces; instead, there is a relative shift which is proportional to the toroidal flow. In a reduced massless electrons scenario it is the ion's poloidal velocity which possesses a finite component perpendicular to magnetic surfaces. Starting from a self-consistent, single-fluid analytical equilibrium developed for a high-beta, high-aspect ratio configuration with sheared flows, we obtain the two-fluid normal component of the velocity perturbatively and benchmark it against the code FLOW2 [1]. We explore the modifications that the normal component of the velocity causes for the development of a Kelvin-Helmholtz instability driven by a sheared toroidal flow.

[1] L. Guazzotto *et. al. Phys. Plasmas*, 22:032501, 2015

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