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**Investigations of the visco-resistive kink( $m=1,n=1$ ) mode using the two fluid CUTIE code** JERVIS MENDONCA, DEBASIS CHANDRA, ABHIJIT SEN, Institute for Plasma Research, ANANTANARAYANAN THYAGARAJA, Retired — We have made numerical simulations of the visco resistive kink ( $m=1,n=1$ ) mode using the CUTIE code, thereby extending our earlier visco-resistive MHD results into the two fluid regime. We report that two fluid effects are extremely influential in the dynamics of the mode. We began our investigations with linear studies on the effects of flow on the the mode. We noticed a change in the two fluid regime which was seen earlier in the case of (2,1) tearing modes by us. Particularly, the symmetry in the normalised growth rate and frequency of the (1,1) mode, as a function of the flow Alfvén Mach numbers, is broken when we include a finite density gradient. We also have observed that by imposing equilibrium poloidal flows, we increase the growth rate of the mode, thereby destabilising, possibly due to the canceling of the intrinsic poloidal flow. The cases with an imposed helical and axial flow also differ from the corresponding single fluid results. These investigations were extended to the nonlinear two fluid regime. We add that imposed poloidal flow can even increase the (1,1) mode's nonlinear saturated energy levels. In conclusion, we remark that these results in the two fluid model complement our results from the single fluid model, and are of great importance for tokamaks.

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