# The Kelvin-Helmholtz instability in weakly ionised plasmas: Ambipolar dominated and Hall dominated flows

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The Kelvin-Helmholtz instability is well known to be capable of converting well-ordered flows into more disordered, even turbulent, flows. As such it could represent a path by which the energy in, for example, bowshocks from stellar jets could be converted into turbulent energy thereby driving molecular cloud turbulence. We present the results of a suite of fully multifluid magnetohydrodynamic simulations of this instability using the HYDRA code. We investigate the behaviour of the instability in a Hall dominated and an ambipolar diffusion dominated plasma as might be expected in certain regions of accretion disks and molecular clouds respectively.

We find that, while the linear growth rates of the instability are unaffected by multifluid effects, the non-linear behaviour is remarkably different with ambipolar diffusion removing large quantities of magnetic energy while the Hall effect, if strong enough, introduces a dynamo effect which leads to continuing strong growth of the magnetic field well into the non-linear regime and a lack of true saturation of the instability.

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