In a hydrodynamic system, e.g. the LLL superfluid, Hall viscosity can be rephrased in terms of its effect on the vorticity of the fluid, $\Omega$:

$$\frac{\partial \Omega}{\partial t} + \nabla \times \nu \omega = \nu_H \nabla^2 \Omega - \omega_c \delta_i v^i.$$

Shear viscosity leads to vorticity diffusion, while Hall viscosity will lead to the creation of vorticity in any region with compression. For example, Hall viscosity leads to precession of vortex dipoles.

The equations of motion can be rearranged to express the total vorticity as:

$$\Omega_{\text{total}} = \nabla \times \frac{P}{\rho} = \Omega_{\text{phase}} + \omega_c - \nu_H \nabla^2 \log \rho,$$

where $P$ is the momentum current and $\rho$ is the mass density.

This will enhance (suppress) the flow around positive (negative) vortices. In particular, this will cause a vortex dipole to rotate.

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