

We have performed a study of quantum turbulence generated in oscillatory counterflow as a continuation of previous experiments on various channel flows of superfluid helium, in the form of coflow, thermal DC counterflow and pure superflow. We have investigated its development, steady state properties and temporal decay, as well as the effect of the resonant mode used to generate the turbulence at three different temperatures, 1.45 K, 1.65 K and 1.83 K. The attenuation of low amplitude second sound, orientated perpendicularly to the long axis of the resonator, was used to determine the amount of quantized vortices created. One of the main goals of this work was to characterize the critical parameters for the onset of instabilities in oscillatory counterflow and to determine their values. Decay measurements of the vortex line density allowed us to distinguish between Vinen-type and Kolmogorov-type decays of quantum turbulence.