



Applied and Computational Mathematics Seminar

Title: Finite-time blowup for an Euler and hypodissipative Navier-Stokes model equation on a restricted constraint space

Speaker: Evan Miller (Institut Mittag-Leffler)

Date: Wed 4th October 2023 at 11:00AM

Location: To be announced

Abstract: In this talk, I will discuss model equations for the Euler and hypodissipative Navier-Stokes equations. These equations are analogous to the Euler equation and hypodissipative Navier-Stokes equation, but with the Helmholtz projection replaced by a projection onto a more restrictive constraint space. The nonlinear term arising from the self-advection of velocity is otherwise unchanged. These model equations have solutions that blow up in finite-time in the inviscid case, as well as in the viscous case when the degree of dissipation is weak enough. The blowup argument makes use of a permutation symmetric Ansatz, which allows for a dyadic energy cascade of the type found in the Friedlander-Katz-Pavlović dyadic Euler/Navier-Stokes model equation. The restricted Euler and hypodissipative Navier-Stokes equations respect both the energy equality and the identity for enstrophy growth for the full Euler and hypodissipative Navier-Stokes equations.

<https://maths.ucd.ie/ACMSeminars/2324/evan.html>