

On the blow-up problem for the Euler equations and the Liouville type results in the fluid equations

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Abstract

In this talk we discuss some new observations regarding the blow-up problem in the 3D Euler equations. We first consider the scenarios of the self-similar blow-ups and the axisymmetric blow-up. For the self-similar Euler equations we prove a Liouville type theorem. For the axisymmetric Euler equations we show that some uniformity condition for the pressure is not consistent with the global regularity. In the second part of talk we present Liouville type theorems for the steady Navier-Stokes equations for both of the incompressible and the compressible cases. In the time dependent case we prove that various pressure integrals have definite sign.