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

Abstract: In this talk we discuss some observations connected with the blow-up problem in the 3D Euler equations. We _rst consider the scenarios of the self-similar blow-up and its generalizations. For the associated self-similar Euler equations we prove a Liouville type theorem by a simpler argument than the previous one, which shows that fast decay ing vorticity at spatial in_nity implies the triviality of solution. For an
extreme case of the self-similar Euler equations, which corresponds to the Euler equations with damping, we show that any velocity decaying solution at spatial in_nity(independent of the decay rate) is trivial. For the axisymmetric Euler equations we observe that the complex Riccati structure exists excluding the pressure term. In this case 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.