

## Wild Weak Solutions of the 3D Axisymmetric Euler Equations

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### **Abstract**

We consider the Cauchy problem for the 3D incompressible axisymmetric swirl-free Euler equations. The convex integration method developed by De Lellis and Székelyhidi rules out the possibility that the Euler equations admit unique admissible weak solutions. It had remained conceivable, though, that axisymmetry of the solution might serve as a selection criterion. Using a surprising link to the 2D isentropic compressible Euler equations, we will show that this is not the case: There exists initial data for which there are infinitely many admissible swirl-free axisymmetric weak solutions of the 3D incompressible Euler equations. Moreover, we show that there exists an axisymmetric swirl-free initial velocity for which the axisymmetry breaks down instantaneously.