Institut für Angewandte Mathematik

Leibniz Universität Hannover

Institut für Angewandte Mathematik
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Oberseminar
Analysis und Theoretische Physik

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Energy conservation for the compressible Euler equations with vacuum

In this talk we will consider the compressible isentropic Euler equations on $\mathbb{T}^d \times [0,T]$, where the pressure p is a function of the density and in most practical applications is of the form $p(\rho) := C\rho^\gamma$ where $1 \leq \gamma < 2$. It has been show that for weak regularity of u and ρ a local energy equation can be formulated if $p \in C^2$. However, for practical applications this means that we must exclude the vacuum case. Here we will improve these results, firstly, by assuming u to be a divergence-measure field, secondly, imposing extra integrability on $1/\rho$ near a vacuum, also assuming ρ to be quasi-nearly subharmonic near a vacuum and finally, by assuming that u and ρ are Hölder continuous. We then extend these results to show global energy conservation for the domain $\Omega \times [0,T]$ where Ω is bounded with a sufficiently smooth boundary. If time allows we will discuss the similarities and differences between these methods and the ones used on the incompressible Euler equations.

Dienstag, 26. Juni 2018, 15:00 Uhr, Raum c311
Hauptgebäude der Universität

Über Ihren Besuch würden sich freuen:

Prof. Dr. Wolfram Bauer
Prof. Dr. Joachim Escher
Prof. Dr. Elmar Schrohe
Prof. Dr. Christoph Walker
Prof. Dr. E. Wiedemann