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A general objective shock wave detection from a geometric singular perturbation approach

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Highlights

- Introduce the pseudo-streamline flattening technique to reduce the governing partial differential equations (PDEs) to ordinary differential equations (ODEs) along each segment of pseudo-streamline.
- Use the geometric singular perturbation theory to decompose the motion in a flow field into two parts, the slow motion with local equilibrium and the fast motion under thermodynamical relaxation which corresponding to the shock wave.
- Provide a rigorous mathematical foundation for the existing empirical shock wave detection methods.

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