

Analysis of Acoustic Field from Supersonic Jet Impinging on Inclined Flat Plate and Curved Plate

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It is known that strong acoustic wave occurred during launching rocket adversely affecting the satellite of the rocket. Therefore, physical understanding and prediction of acoustic wave is required. Then, flow-field and acoustic-field, when a supersonic jet impinges on an inclined flat plate and an inclined arc plate are computationally simulated toward the prediction of the rocket plume acoustic. WCNS is used to solve 3-dimensional compressible Navier-Stokes equations. In this research, investigation of effects to acoustic-field by changing plate angle and curvature of arc plate are conducted. The results show that two acoustic wave generated by interfering of the shear layer and the shock wave are confirmed near the jet impinging point. And, they determine the magnitude of acoustic wave near the fairing of the rocket and over all sound pressure level become larger when curvature of arc plate increases.

Keywords: Shape of jet impinging point, Shock wave, Acoustic wave, Sound pressure level