Project Title: Supersonic Jet Noise Characterization and Suppression

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Project Description

The advent of jet engine as a power plant for military and civil aircraft and its unavoidable counterpart, jet engine noise, initiated substantial research on the sources and causes of jet noise, as well as methods and devices for its reduction. The noise level of jet engines, particularly during takeoff and climb, is often a concern for people living near airports or working near airplanes. Such high noise levels can limit future airport air traffic expansion, and force new airports to occupy remote sites. It also limits the ability of personnel to work for extended times near airplanes. New requirements for lower jet noise are a continued area of interest both by governmental agencies and by neighborhoods located in close proximity to airports, flight paths and to engine and flight vehicle manufacturers. Due to these concerns a need to further jet noise reduction technology is in demand. Various approaches have been proposed to overcome the noise issue. The optimal solution should be such that substantial noise suppression is achieved using a method that is easy to implement, low cost, reliable, and without substantial adverse effects on the engine performance. Development of such devise requires basic understanding of the noise generation mechanisms. The objectives of our research are to evaluate experimentally new concepts for jet noise reduction and to develop analytical or numerical tools for the prediction of jet noise and jet noise reduction techniques for commercial and military engines (subsonic and supersonic jets).