Bayesian analysis of equivalent sound sources for a military jet aircraft[1] DAVID HART, Brigham Young University — Radiated jet noise is believed to be generated by a mixture of fine-scale turbulent structures (FSS) and large-scale turbulent structures (LSS). In previous work, the noise from an F -22A Raptor has been modeled as two sets of monopole sources whose characteristics account for both FSS and LSS sound propagation [Morgan, J. Acoust. Soc. Am. **129**, 2442 (2011)]. The source parameters are manually adjusted until the calculations produce the measured field along a surface. Once this has been done, the equivalent source of monopoles can be used to further analyze the sound field around the jet. In order to automate this process, parameters are selected based on Bayesian methods that are implemented with simulated annealing and fast Gibbs sampler algorithms. This method yields the best fit parameters, and the sensitivity of the solution based on generated posterior probability distributions (PPD). For example, analysis has shown that the peak source region of the LSS is more important than the peak source region of the FSS. Further analysis of the generated PPD's will give greater insight into the nature of the radiated jet noise.

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