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On the reduction of flap side edge noise

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Results from flap side edge noise reduction experiments are presented. The test model used was a NACA 632-215 main-element airfoil with a half-span Fowler flap. The flap side edge was flat for the baseline configuration. The effect that small geometric variations of the flap edge have on the noise spectra is shown, and noise measurements from a "continuous mold-line link" (CML) flap configuration are presented. These measurements are compared to those obtained from the baseline flap. The results indicate that a large level of noise reduction is achieved using the CML flap. Finally, Particle Image Velocimetry (PIV) measurements of the flow in the region of a flap side edge are presented for a blowing flap configuration. In this active control approach, air was blown from small slots located along the side edge of the flap to weaken the vortex system that is present in that region of the flap. These measurements are presented to show the effects that the flap tip jets have on the structure of the flap side edge flow, and the potential that this blowing flap configuration has in reducing flap side edge noise.