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Cross-stream ejection in the inter-wheel region of aircraft landing gears[1] PHILIP MCCARTHY, ALIS EKMEKCI, University of Toronto — The reduction of aircraft noise is an important challenge currently faced by aircraft manufacturers. During approach and landing, the landing gears contribute a significant proportion of the aircraft generated noise. It is therefore critical that the key noise sources be identified and understood in order for effective mitigation methods to be developed. For a simplified two-wheel nose landing gear, a strong cross stream flow ejection phenomena has been observed to occur in the inter-wheel region in presence of wheel wells. The location and orientation of these flow ejections causes highly unsteady, three dimensional flow between the wheels that may impinge on other landing gear components, thereby potentially acting as a significant noise generator. The effects of changing the inter-wheel geometry (inter-wheel spacing, the wheel well depth and main strut geometry) upon the cross-stream ejection behaviour has been experimentally investigated using both qualitative flow visualisation and quantitative PIV techniques. A summary of the key results will be presented for the three main geometrical parameters under examination and the application of these findings to real life landing gears will be discussed.

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