

Abstract Submitted  
for the DFD10 Meeting of  
The American Physical Society

**Secondary Instability in the Flow past Two Aligned Square Cylinders**<sup>1</sup> CHOON-BUM CHOI, Inha University, Korea, YONG-JUN JANG, Korea Railroad Research Institute, Korea, KYUNG-SOO YANG, HYUNJUN JEON, Inha University, Korea — Interference of the wakes behind two nearby bluff bodies is important in many engineering applications. In this investigation, secondary instability (SI) in the flow past two square cylinders in side-by-side or tandem arrangements has been numerically studied via a Floquet analysis. An immersed boundary method was employed to implement the cylinders in the computational domain. The distance between the neighboring faces of the two cylinders ( $G$ ) is the key parameter which affects SI under consideration. In this presentation, we report the critical Reynolds number for SI and the corresponding spanwise wave number of the most unstable (or least stable) wave for each of the selected  $G$ s. Several distinct modes were identified in both arrangements, and described in detail. The representative three-dimensional vortical structure of each mode was depicted with vorticity contours. We also attempted to explain the underlying mechanisms of the key features of the secondary instability from the view points of flow physics.

<sup>1</sup>This work was supported by Korea Railroad Research Institute (Research Title: The study of standardization for urban railway facilities (SW10002)).

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Date submitted: 11 Aug 2010

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