## Abstract Submitted for the DFD09 Meeting of The American Physical Society

Flow visualization of sterile air flows in surgical environments¹ JAMES MCNEILL, JEAN HERTZBERG, ZHIQIANG ZHAI, University of Colorado, Boulder — The current design of surgical environments uses laminar flow air diffusers, originally intended for clean room environments, to provide clean, low-turbulence ventilation air across the patient surgical wound and aseptic regions of the surgical staff. The objective of the current design is to minimize turbulence which increases mixing between the sterile air field and any non-sterile areas. Full-scale laboratory experiments using laser sheet illumination were conducted to investigate the interface between the sterile air field underneath the laminar flow diffusers and the non-sterile room air in the area surrounding the diffuser array. The shear layer between the sterile air and the room air resulted in turbulent mixing. In addition, the shear layer boundary angled towards the patient causing the migration of contaminants towards the aseptic region. Further research is being conducted to understand the impact of the free shear layer along the boundary of the laminar flow diffuser array on contaminant transport into the sterile region.

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