

Abstract Submitted  
for the DFD06 Meeting of  
The American Physical Society

**DNS of flow in stenosed carotid artery**<sup>1</sup> LEOPOLD GRINBERG, Brown University, ALEXANDER YAKHOT, Ben-Gurion University, GEORGE KARNIADAKIS, Brown University — Direct numerical simulation (DNS) of a three-dimensional flow through a stenosed carotid artery has been performed. Onset of turbulence downstream of the occlusion has been observed. The developing turbulence is characterized by an alternating spatio-temporal transitional regime. The transition to turbulence occurs during the systolic phase approximately five throat-diameters downstream of the throat, while laminarization occurs during the diastolic phase. Transition in space is first enhanced and subsequently decays downstream. The wall shear stress increases in the stenosed internal carotid artery due to the vessel occlusion and as the result of turbulence.

<sup>1</sup>Authors are gratefully acknowledge the partial support of NSF-IMAG program.

George Karniadakis  
Brown University

Date submitted: 12 Oct 2006

Electronic form version 1.4