1125-76-2888 **Manal Badgaish*** (mbadgai2@masonlive.gmu.edu), Department of Mathematical Sciences, George Mason University, Fairfax, VA 22030, **Jeng-Eng Lin** (jelin@gmu.edu), Department of Mathematical Sciences, George Mason University, Fairfax, VA 22030, and **Padmanabhan Seshaiyer** (pseshaiy@gmu.edu), Department of Mathematical Sciences, George Mason University, Fairfax, VA 22030. *Non-linear dynamics and analysis of Intracranial Saccular Aneurysms with growth and remodeling.*

In this work a new mathematical model for the interaction of blood flow with the arterial wall surrounded by cerebral spinal fluid is developed with applications to intracranial saccular aneurysms. The blood pressure acting on the inner arterial wall is modeled via a Fourier Series, the arterial wall is modeled as a spring-mass system incorporating growth and remodeling and the surrounding cerebral spinal fluid is modeled via a simplied Navier-Stokes equation. The resulting non-linear coupled fluid structure interaction problem is analyzed and a perturbation technique is employed to derive the first-order approximation solution to the system. An analytical solution is also derived for the linearized version of the problem using Laplace transforms. The solutions are validated against related work from the literature and the results suggest the biological significance of the inclusion of the growth and remodeling effects on the rupture of intracranial aneurysms. (Received September 20, 2016)