1133-47-75 **Soumyashant Nayak*** (nsoum@upenn.edu), 10-100, Smilow Research Center, 3400 Civic Center Blvd., Philadelphia, PA 19104. *The Hadamard Determinant Inequality in Finite von Neumann Algebras.*

The classical Hadamard determinant inequality in essence says that an $n$-parallelopiped with prescribed lengths of sides has maximum volume iff the sides are mutually orthogonal. It is useful in proving convergence results in the classical Fredholm theory of integral equations. Further, Fischer's generalization of the inequality has seen many applications in statistics. Our goal is to view these results in the setting of finite von Neumann algebras. We will briefly discuss the notion of a determinant, due to B. Fuglede and R. Kadison, for finite von Neumann algebras and review some basic results on conditional expectations on von Neumann algebras. In this setting, we will see a proof of a generalized form of the Hadamard inequality and a simple characterization of the equality condition. We further extend this inequality in the context of operator monotone functions on $[0, \infty)$ still retaining the simple form of the equality condition. Finally we will see some applications to obtain estimates for determinants of perturbed positive-definite matrices. (Received July 11, 2017)