1125-81-197 **Stefan Huber**, **Robert Koenig** and **Anna Vershynina*** (annavershynina@gmail.com), BCAM (Basque Center for Applied Mathematics), Alameda de Mazarredo 14, 48009 Bilbao, Bizkaia, Spain. *Quantum analogues of geometric information theoretic inequalities.*

Geometric inequalities, such as the entropy power inequality or the isoperimetric inequality, relate geometric quantities, such as volumes and surface areas. Classically, these inequalities have useful applications for obtaining bounds on channel capacities, and deriving Log-Sobolev inequalities. In my talk I provide quantum analogues of certain well-known inequalities from classical Information Theory, with the most notable being the isoperimetric inequality for entropies. The latter inequality is useful for the study of convergence of certain semigroups to fixed points. In the talk I demonstrate how to apply the isoperimetric inequality for entropies to show exponentially fast convergence of quantum Ornstein-Uhlenbeck (qOU) semigroup to a fixed point of the process. The inequality representing the fast convergence can be viewed as a quantum analogue of a classical Log-Sobolev inequality. As a separate result, necessary for the fast convergence of qOU semigroup, I argue that gaussian thermal states minimize output entropy for the attenuator semigroup among all states with a given mean-photon number. (Received August 15, 2016)