1121-46-251 **Michael P Brannan*** (mbrannan@math.tamu.edu) and **Benoit Collins**. *Quantum channels from quantum group invariants.*

Quantum channels are trace-preserving completely positive maps between matrix algebras, and these objects are of central importance in quantum information theory. Thanks to Stinespring's Dilation Theorem, the structure of a given quantum channel is encoded in a certain subspace of a tensor product of two finite dimensional Hilbert spaces. Thus, to construct "interesting" quantum channels, one has to find "interesting" subspaces of tensor product Hilbert spaces. In practice, one relevant property of the subspace is that it is highly entangled, in the sense that the subspace is very far from the cone of decomposable tensors in the tensor product. In this talk I will describe a class of highly entangled subspaces arising from the invariant theory of free orthogonal quantum groups. It turns out that the rich structure of the quantum group invariants we are considering allows us to gain a good understanding of the corresponding quantum channels (such as minimum output entropy estimates and the outputs of tensor products of these channels). This is based on joint work with Benoit Collins. (Received July 19, 2016)