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**Matthew J. Ziemke\***, University of South Carolina, Department of Mathematics, 1523 Greene Street, Columbia, SC 29208, and **George Androulakis**, University of South Carolina, Department of Mathematics, 1523 Greene Street, Columbia, SC 29208. *Generators of Quantum Markov Semigroups*.

Quantum Markov Semigroups (QMSs) originally arose in the study of the evolutions of irreversible open quantum systems. Mathematically, they are a generalization of classical Markov semigroups where the underlying function space is replaced by a non-commutative operator algebra. In the case when the QMS is uniformly continuous, theorems due to Lindblad, Stinespring, and Kraus imply that the generator of the semigroup has the form

$$L(A) = \sum_{n=1}^{\infty} V_n^* A V_n + GA + AG^*$$

where  $V_n$  and  $G$  are elements of the underlying operator algebra. The form of the generator of a general QMS acting on the bounded operators of a Hilbert space remained open since 1976. In a recent work we proved the generators of general QMSs (not necessarily uniformly continuous) must also satisfy the form given by Lindblad and Stinespring. In this talk I will explain these results and present some examples in order to clarify these findings. (Received September 14, 2014)