Mathematical Physics

Induced Metric And Matrix Inequalities On Unitary Matrices

H. F. Chau, C.-K. Li, Y.-T. Poon, N.-S. Sze

(Submitted on 6 Jul 2011 (v1), last revised 21 Jan 2012 (this version, v2))

Recently, Chau [Quant. Inform. & Comp. 11, 721 (2011)] showed that one can define certain metrics and pseudo-metrics on U(n), the group of all $n\times n$ unitary matrices, based on the arguments of the eigenvalues of the unitary matrices. More importantly, these metrics and pseudo-metrics have quantum information theoretical meanings. So it is instructive to study this kind of metrics and pseudo-metrics on U(n). Here we show that any symmetric norm on ${\mathbb R}^n$ induces a metric on U(n). Furthermore, using the same technique, we prove an inequality concerning the eigenvalues of a product of two unitary matrices which generalizes a few inequalities obtained earlier by Chau [arXiv:1006.3614v1].

Comments:	6 pages, extensively rewritten with an earlier error fixed. It generalizes and simplifies the mathematical results concerning certain matrix inequalities originally reported in arXiv:1006.3614v1. To appear in J.Phys.A
Subjects:	**Mathematical Physics (math-ph)**; Spectral Theory (math.SP); Quantum Physics (quant-ph)
Cite as:	**arXiv:1107.1047 [math-ph]** (or **arXiv:1107.1047v2 [math-ph]** for this version)

Submission history

From: Hoi Fung Chau [view email]
[v1] Wed, 6 Jul 2011 07:54:30 GMT (6kb)
[v2] Sat, 21 Jan 2012 00:56:14 GMT (12kb)

Which authors of this paper are endorsers?