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MAPS PRESERVING SPECTRAL RADIUS, NUMERICAL RADIUS, SPECTRAL NORM*

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Abstract. Characterizations are obtained for Schur (Hadamard) multiplicative maps on complex matrices preserving the spectral radius, numerical radius, or spectral norm. Similar results are obtained for maps under weaker assumptions. Furthermore, a characterization is given for maps f satisfying $\|A \circ B\| = \|f(A) \circ f(B)\|$ for all matrices A and B.

Key words. Schur product, Spectral radius, Numerical radius, Spectral norm, l_p norm.

AMS subject classifications. 15A04, 15A18, 15A60.

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