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Eigenmatrices and operators commuting with finite rank operators.

Using eigenmatrices, we characterize when a bounded operator in Hilbert space commutes with a finite rank operator. We use this characterization to prove that if an operator commutes with a finite rank operator, then it must commute with an operator of rank one. As a corollary of this, we show that (classical) Toeplitz operators do not commute with operators of finite rank. (Received August 29, 2005)