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In this talk, we discuss the existence of a unique adjoint for closed densely defined linear operators on Banach spaces. This result is used to extend theorems of von Neumann, Lax and Kaufman. We also prove that the set of bounded linear operators is open in the set of closed densely defined linear operators on a separable Banach space. This last result allows us to define a new metric for closed densely defined linear operators on Banach spaces. As an application, we show that there is a natural extension of the Fredholm theory and the Schatten classes, which closely parallels the corresponding results for Hilbert spaces. We do not attempt to be exhaustive but, to indicate the power of our approach, we provide extensions of the important theorems of Weyl, Horn, Lalesco and Lidskii.

T. L. Gill, S. Basu, W. W. Zachary and V. Steadman Adjoint for Operators on Banach Space, Proc. Amer. Math. Soc. 132, (2003), 1429-1434. (Received September 19, 2004)