When is a Statistical Operator Separable?
– A Comparison of Different Definitions

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Quantum correlations are based on the *non*-separability of the total system's statistical operator. The notion of non-separability, on the other hand, is given with respect to the precise meaning of separability only. So it is a crucial task to define separability in terms of statistical operators. A recently proposed approach offers several advantages with respect to the usual definition. The von Neumann entropy S allows to develop a measure $I_{a/b}$ of the relative non-separability of an operator ρ_a with respect to another operator ρ_b. This is a system immanent quantity of any property type as, e. g. spin or polarization. We compare the effect of the different approaches on S and $I_{a/b}$. Finally, the applicability of a common separability criterion will be checked.

Key words: Statistical Operators; von Neumann Entropy; Separability.