From forms to semigroups

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Sesquilinear forms are a powerful tool to generates one-parameter semigroups on Hilbert space. We will give a survey on the method with emphasis on operator theoretical aspects.

A first part concerns recent results on sectorial forms obtained in collaboration with Tom ter Elst. To each sectorial form a holomorphic semigroup can be associated in a natural way. The notion of closability is shown to be superfluous. A variety of are examples obtained by forms. We will give a characterization of those operators which are associated with a form in terms of their H^∞-infinity functional calculus. Perturbation will be discussed and forms having a numerical range in a parabola are considered. This leads us to second order problems and cosine functions.

References.

1. W. Arendt, A.F.M. ter Elst: *Sectorial forms and degenerate differential operators.* J. Operator Th., to appear, and arXiv: 0812.3944.

2. W. Arendt, C. Batty: *Forms, Functional Calculus, Cosine Functions and Perturbation.* Banach Center Publications Warsaw, **Vol. 75** (2007), 17–38.