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**Marat V. Markin\*** (mmarkin@csufresno.edu), 5245 N. Backer Avenue, M/S PB 108, Fresno, CA 93740-8001. *On the Smoothness of Weak Solutions of an Abstract Evolution Equation with a Scalar Type Spectral Operator*. Preliminary report.

For the abstract evolution equation

$$y'(t) = Ay(t), \quad t \geq 0,$$

with a *scalar type spectral operator*  $A$  in a complex Banach space, we find conditions on  $A$  *necessary and sufficient* for all *weak solutions* of the equation, which a priori need not be differentiable, to be *infinite differentiable* or *Gevrey ultradifferentiable* (in particular, *analytic* or *entire*) on  $[0, \infty)$  or  $(0, \infty)$  and analyze certain effects of their *smoothness improvement*.

Due to the *scalar type spectrality* of  $A$ , all the foregoing characterizations are formulated exclusively in terms of the location of its *spectrum* and generalize their analogues obtained earlier for a *normal operator*  $A$  in a complex Hilbert space. (Received September 16, 2016)