UNIVERSITY OF PUERTO RICO
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DEPARTMENT OF MATHEMATICS

COLLOQUIUM

ASYMPTOTIC BEHAVIOR OF FRACTIONAL ORDER EVOLUTION EQUATIONS

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Resumen. Using the theory of regularized families, and Banach's fixed point theorem, we prove existence and uniqueness of mild solutions for the semilinear fractional order differential equation

$$D_t^{\alpha+1}u(t) + \mu D_t^{\beta}u(t) = Au(t) + f(t, u(t)),\ t > 0,$$

where $0 < \alpha \leq \beta \leq 1$, $\mu > 0$, with the property that the solution decomposes, uniquely, into a periodic term (resp. almost periodic, almost automorphic, compact almost automorphic) and a second term that decays to zero. The general result on the asymptotic behavior is obtained by first establishing a sharp estimate on the solution family associated to the linear equation.

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