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On oscillation and stability of equations with a distributed delay

We consider nonlinear equations with a distributed delay which involve integrodifferential equations. In the case of a single variable concentrated delay we have the equation $x'(t) = r(t) [f(x(t-h(t))) - x(t)]$ which is compared to the difference equation $x_{n+1} = f(x_n)$. In particular, under certain conditions global attractivity of the latter equation implies stability of the former one, independently of a bounded delay. We also present some delay-dependent stability, oscillation and non-oscillation conditions. The results are applied to the Nicholson's blowflies equation and the Mackey–Glass equation with a distributed delay.

This is a joint work with L. Berezansky, D. Kinzebulatov and S. Zhukovskiy.