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Integro-differential Equations: Progressive Contractions.

First order integro-differential equations bear a special relation to fixed point theory. We will briefly describe how the new concept of “progressive contractions” works with “direct fixed point methods” to produce the following:

1. Lipschitz maps become contractions
2. The sum of two contractions can be a contraction even when the sum of the constants exceed 1
3. Continuous maps become compact maps. In particular:
 - a. Krasnoselskii’s theorem on the sum of two operators can collapse into Schauder’s theorem.
 - b. When the kernel is positive then Schaefer’s theorem and a Liapunov function yield a unique global bounded solution. (Received February 04, 2017)