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*The periodic problem for semilinear differential inclusions in Banach spaces*

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**Abstract:** Sufficient conditions on the existence of periodic solutions for semilinear differential inclusions are given in general Banach space. In our approach we apply the technique of the translation operator along trajectories. Due to recent results it is possible to show that this operator is a so-called decomposable map and thus admissible for certain fixed point index theories for set-valued maps. Compactness conditions are formulated in terms of the Hausdorff measure of noncompactness.

**Keywords:** periodic solutions, translation operator along trajectories, set-valued maps,  $C_0$ -semigroup,  $R_\delta$ -sets

**AMS Subject Classification:** 34A60, 34C25, 47H11