

Invariance and Strict Invariance of Evolution Equations

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When studying autonomous evolution equations of the form

$$\dot{u} \in -Au + f(u), \quad u(0) = x_0 \in K \cap \Omega,$$

where $A : D(A) \rightarrow X$, X is a Banach space, is a general (possibly multivalued) accretive operator satisfying the range condition, or an m -accretive operator, $f : \Omega \rightarrow X$ is a continuous map and $K \subset X$ is closed, questions concerning different types of invariance are of importance. For instance we seek for conditions implying that every solution (in general solutions of the above problem are not unique) remains in K for the life-time. Such problems have numerous applications in different sciences: physics, engineering and/or control theory. The results I am going to speak about, see[1], are related to recent studies of Cannarsa, Da Prato and Frankowska and Chill, Hauer and Kennedy. I will introduce some criteria for invariance and the so-called strong invariance and compare it with existing ones.

REFERENCES

- [1] A. Ćwiszewski, G. Gabor, W. Kryszewski, Invariance and strict invariance for nonlinear evolution problems with applications *Nonlinear Analysis*, **218** (2022), 112756.