On pseudocompact topological inverse Brandt semigroups

Kateryna Pavlyk

University of Tartu

Tartu, Estonia

Let S be a semigroup with zero and λ be a cardinal ≥ 1.

On the set $B_\lambda(S) = \lambda \times S \times \lambda \cup \{0\}$ we define the semigroup operation as follows $(\alpha, a, \beta) \cdot (\gamma, b, \delta) = (\alpha, ab, \delta)$, if $\beta = \gamma$ and equals to zero othervise, for all $\alpha, \beta, \gamma, \delta \in \lambda$ and $a, b \in S$. The semigroup $B_\lambda(S)$ is called the *Brandt λ-extension of the semigroup S* [2]. A Brandt λ-extension of a group is called a *Brandt semigroup*.

Definition 1. [2] Let $\mathcal{S}$ be some class of topological semigroups and $(S, \tau) \in \mathcal{S}$. Let τ_B be a topology on $B_\lambda(S)$ such that $\tau_B \mid_{S_{\alpha,\alpha}} = \tau$ for some $\alpha \in \lambda$. Then $(B_\lambda(S), \tau_B)$ is called a *topological Brandt λ-extension of (S, τ) in $\mathcal{S}$*. If $\mathcal{S}$ coincides with the class of all topological semigroups, then $(B_\lambda(S), \tau_B)$ is called *topological Brandt λ-extension of (S, τ)*.

In this work we study the structure of pseudocompact completely 0-simple topological inverse semigroups by means of the topological Brandt λ-extension. As a consequence of this result the analogue of Comfort-Ross theorem for topological semigroups was obtained [1].

In [2], we obtained criteria of (absolute) H-closedness of $B_\lambda(S)$ in the class of topological inverse semigroups. In this talk we present the sufficient conditions on topological Brandt λ-extensions for preserving the (absolute) H-closedness.

This work is based on a joint work with Oleg Gutik.

References

[1] W. W. Comfort, K. A. Ross, Pseudocompactness and uniform continuity in topological groups, *Pacific J. Math.* 16 (1966), 483-496.

[2] O. V. Gutik, K. P. Pavlyk, On Brandt λ^0-extensions of semigroups with zero, *Mat. Metods and Phys.-Mech. Fields.* 49 (2006), no. 3, 26-40.