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On the direct product of fuzzy topological groups. (English) Zbl 0597.22003

For basic definitions, see the authors’ preceding paper [ibid. 12, 289-299 (1984; Zbl 0577.22003)].

For $1 \leq i \leq n$, let $A_i$ be a fuzzy set in the fuzzy topological group (ftg.) $(X_i, T_i)$. Then $\prod_{i=1}^n A_i$ is the fuzzy set in $X = \prod_{i=1}^n X_i$ that has membership function given by $\mu_{A_i}(x(1), \ldots, x(n)) = \min\{\mu_{A_1}(x(1)), \ldots, \mu_{A_n}(x(n))\}$.

$U_{x_{\lambda}}(i)$ a fuzzy open Q-nbd. system of $x_{\lambda}^i$ relative to $T_i$, and $U_{x_{\lambda}} = \{U_{x_{\lambda}} \mid$ there exists $U_i \in U_{x_{\lambda}}^i, 1 \leq i \leq n,$ such that $\prod_{i=1}^n U_i \subseteq U_{x_{\lambda}}\}$. Then $T = \{U \in U_{x_{\lambda}} \text{ whenever } x_{\lambda}^i U\}$ is a fuzzy topology for $X; U_{x_{\lambda}}$ is a Q-neighbourhood system of $x_{\lambda};$ and $(X, T)$ is a ftg.

Furthermore, let the ftg $(X, T)$ be the dissolved direct product of normal subgroups $(N_i, T_i), 1 \leq i \leq k,$ of the algebraic group $X$; $(X', T')$ be the direct product of the ftg’s $(N_i, T_i);$ and $f, f_i$ be the maps given by $(x(1), \ldots, x(k)) \mapsto x(1)\ldots x(k)$ and $x(i) \mapsto (e, \ldots, e, x(i), e, \ldots, e), \text{ respectively.}$ Then $f$ is an isomorphism of the ftg $(X', T')$ onto $(X, T),$ and, if $(X, T)$ is a fully stratified space, then $f f_i$ is the identity map on $(N_i, T_i).$

Reviewer: D.Grant

MSC:
22A99 Topological and differentiable algebraic systems
54A40 Fuzzy topology
03E72 Theory of fuzzy sets, etc.

Keywords:
fuzzy set; fuzzy topological group; fuzzy topology

Full Text: DOI

References:

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