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On topological and algebraic structure of extremally disconnected semitopological groups

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Abstract: Starting with a very simple proof of Frolík's theorem on homeomorphisms of extremally disconnected spaces, we show how this theorem implies a well known result of Malychin: that every extremally disconnected topological group contains an open and closed subgroup, consisting of elements of order 2. We also apply Frolík's theorem to obtain some further theorems on the structure of extremally disconnected topological groups and of semitopological groups with continuous inverse. In particular, every Lindelöf extremally disconnected semitopological group with continuous inverse and with square roots is countable, and every extremally disconnected topological field is discrete.

Keywords: extremally disconnected, semitopological group, order 2, Souslin number, Lindelöf space
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