Summary: We introduced the concept of $G$-shadowing property, $G$-strong shadowing property and $G$-limit shadowing property in the product space under the action of topological group. By means of properties of the product map, the relationship in these shadowing properties between product mapping $f \times g$ and sub mapping $f, g$ were studied. The following conclusions were obtained: (1) the product map $f \times g$ has the $G$-shadowing property if and only if the map $f$ has the $G_1$-shadowing property and the map $g$ has the $G_2$-shadowing property; (2) the product map $f \times g$ has the $G$-strong shadowing property if and only if the map $f$ has the $G_1$-strong shadowing property and the map $g$ has the $G_2$-strong shadowing property; (3) the product map $f \times g$ has the $G$-limit shadowing property if and only if the map $f$ has the $G_1$-limit shadowing property and the map $g$ has the $G_2$-limit shadowing property. The conclusions made some supplements for the theory of strong shadowing property and limit shadowing property in the product space under the action of topological group.

MSC:
37B65 Approximate trajectories, pseudotrajectories, shadowing and related notions for topological dynamical systems
37B02 Dynamics in general topological spaces

Keywords:
$G$-shadowing property; $G$-strong shadowing property; $G$-limit shadowing property; product mapping

Full Text: DOI