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A topological application of the monodromy groupoid on principal bundles. (English)

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A groupoid is a small category such that every morphism has an inverse. A topological groupoid is a groupoid in which both sets of objects and morphisms have topologies such that all maps of the groupoid structure are continuous. Let G be a topological groupoid and W an open subset of G which contains all the identities. Let $F(W)$ be the free groupoid on W and N the normal subgroupoid of $F(W)$ generated by the elements in the form $[ba]^{-1}[b][a]$ for $a, b \in W$ such that ba is defined and $ba \in W$. Then the quotient groupoid $M(G, W)$ of $F(W)$ by N is called the monodromy groupoid of G for W . Suppose $p : E \rightarrow X$ is a principal bundle in the sense of *C. Ehresmann* [“Catégories topologiques et catégories différentiables”, in: Colloque Géom. Différ. Globale, Bruxelles 1958, 137-150 (1959; Zbl 0205.28202)] with certain conditions, it is proved that an open subset of the groupoid $G = X \times X$ can be chosen such that the monodromy groupoid $M(G, W)$ is a topological groupoid and acts topologically on the topological space E via p .

Reviewer: [Dexue Zhang \(Chengdu\)](#)

MSC:

[18B40](#) Groupoids, semigroupoids, semigroups, groups (viewed as categories)

[54B30](#) Categorical methods in general topology

[20L05](#) Groupoids (i.e. small categories in which all morphisms are isomorphisms)

Keywords:

topological groupoid; monodromy groupoid; principal bundle

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