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Title: Isotropy index for the connected sum and the direct product of manifolds

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A subspace or subgroup is isotropic under a bilinear map if the restriction of the map on it is trivial. We study maximal isotropic subspaces or subgroups under skew-symmetric maps and, in particular, the isotropy index – the maximum dimension of an isotropic subspace or maximum rank of an isotropic subgroup. For a smooth closed orientable manifold M , we describe the geometric meaning of the isotropic subgroups of the first cohomology group with different coefficients under the cup product. We calculate the corresponding isotropy index, as well as the set of ranks of all maximal isotropic subgroups, for the connected sum and the direct product of manifolds. Finally, we study the relationship of the isotropy index with the first Betti number and the co-rank of the fundamental group. We also discuss applications of these results to the topology of foliations.

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