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7. Lie Groups and Lie Algebras

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Lie groups with surjective exponential function

Until now the characterization of Lie groups with surjective exponential function is not solved in general. However, for special classes of Lie groups there exists such a characterization: Solvable Lie groups, semisimple Lie groups, and splittable Lie groups with surjective exponential map are totally classified. In all these cases special centralizers of nilpotent elements of the Lie algebra play an important role. Moreover, there exists a complete list of all linear simple exponential Lie groups. A survey on the already existing results will be presented.

Reference: D. Djoković and K. H. Hofmann, The exponential in real Lie groups: A status report, J. Lie Theory **7** (1997), 171–199