Why are Lie groups useful in theoretical physics and soccer?

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Abstract

This seminar aims to give an introduction on Lie groups and their applications in theoretical physics as well as in soccer. After recalling some definitions from group theory and topology, we will focus on the definition of Lie groups giving several examples such as the orthogonal group and the special orthogonal group. We will then prove Euler's rotation theorem and explain how useful it can be in a soccer match. In the end an application of Lie groups in high energy physics will be shown.