

利用单参数Lie群组的一种可解性求自治系统首次积分的方法

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Searching for First Integral of Autonomous System Based on a Kind of Solvability of One-parameter Lie Groups

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摘要 讨论了自治系统接受的单参数Lie群组具有一种可解性的情况下 求系统的一个首次积分的具体方法. 对于 n 阶自治系统, 给出相应参数的一组确定取值, 求得系统首次积分; 对于三阶自治系统, 当系统接受的单参数Lie群组可解时, 验证求得首次积分的条件一定成立.

关键词: [自治系统](#) [单参数Lie群组](#) [可解性](#) [首次积分](#)

Abstract: The method for obtaining one first integral of autonomous systems accepting a series of one-parameter Lie groups with the solvability was discussed. For n -th order autonomous systems accepting $n-1$ solvable one-parameter Lie groups, a specific method for obtaining first integrals by valuing the parameters was given. Specially, the method for obtaining first integrals of the third order autonomous systems accepting two solvable one-parameter Lie groups was discussed. Furthermore, the method for obtaining first integrals was proved to be right without any conditions.

Key words: [autonomous systems](#) [one-parameter Lie groups](#) [solvability](#) [first integral](#)

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