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局部 **RF-KO** 方法降低同步环低能慢引出束流能散

摘要

紧凑型质子同步加速器是常用的空间辐射模装置，三阶共振慢引出技术是该类装置最常用的引出方法。但是该方法在低能量区间（一般小于 60 MeV）因为纵向发射度大会导致引出束流能散大，从而降低引出效率；此外，受强空间荷效应影响，束流发射度增长激励困难，且会出现质心振荡，从而导致引出束流不稳定等。为此，我们提出一种局部横向射频踢脚（RF-KO）激励方法，可以有效减弱上述效应的影响。本研究聚焦于使用局部 RF-KO 激励降低引出束流的能散，通过模拟计算验证了该方法的有效性。

关键词

质子同步加速器、低能慢引出、RF-KO 激励、动量分散

Abstract

For space radiation simulation applications, low-energy slow extraction from proton synchrotron suffers from strong space charge effect. Using high-order harmonic excitation and extraction below resonance can solve this. Based on above, we studied local RF-KO method to reduce energy spread of extracted beam and the effectiveness is demonstrated through simulation.

Keywords

Proton Synchrotron, low-energy slow extraction, RF-KO excitation, energy spread

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