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标题: A laser system for the spectroscopy of highly charged bismuth ions
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来源出版物: APPLIED PHYSICS B-LASERS AND OPTICS 卷: 107 期: 4 页: 1069-1074
DOI: 10.1007/s00340-011-4732-8 出版年: JUN 2012
在 Web of Science 中的被引频次: 0
被引频次合计: 0
引用的参考文献数: 19
摘要: We present and characterize a laser system for the spectroscopy on highly charged Bi-209(82+) ions at a wavelength of 243.87 nm. For absolute frequency stabilization, the laser system is locked to a near-infra-red laser stabilized to a rubidium transition line using a transfer cavity based locking scheme. Tuning of the output frequency with high precision is achieved via a tunable rf offset lock. A sample-and-hold technique gives an extended tuning range of several THz in the UV. This scheme is universally applicable to the stabilization of laser systems at wavelengths not directly accessible to atomic or molecular resonances. We determine the frequency accuracy of the laser system using Doppler-free absorption spectroscopy of Te-2 vapor at 488 nm. Scaled to the target wavelength of 244 nm, we achieve a frequency uncertainty of sigma (244 nm)=6.14 MHz (one standard deviation) over six days of operation.
入藏号: WOS:000305730200020
语种 : English
文献类型: Article
KeyWords Plus: INTERFEROMETRIC FREQUENCY-MEASUREMENT; TE-130(2) REFERENCE LINE; HYPERFINE-STRUCTURE; SPECTROMETER; TRANSITIONS; CALIBRATION; CAVITY; FIELDS
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出版商: SPRINGER
出版商地址: 233 SPRING ST, NEW YORK, NY 10013 USA
Web of Science 类别: Optics; Physics, Applied
研究方向: Optics; Physics
IDS 号: 964XO
ISSN: 0946-2171
29 字符的来源出版物名称缩写: APPL PHYS B-LASERS O
ISO 来源出版物缩写: Appl. Phys. B-Lasers Opt.
来源出版物页码计数: 6