



VECSEL

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VECSEL – a versatile laser tool for ion trappers

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Vertical-external-cavity surface-emitting lasers (VECSELs, aka. OPSLs or SDLs) [1] are versatile lasers combining the wide spectral coverage of semiconductor gain media with the flexibility offered by optically pumped solid-state disk laser architectures. The benefits of VECSELs have been recently leveraged to ion trapping with the demonstration of a trapping system fully based on these novel light sources [2]. Here we present a compact narrow-linewidth VECSEL prototype platform developed for applications in atomic and molecular physics. In particular, we display a 1118 nm system suitable for Doppler cooling of Mg⁺ ions. We also review the wavelength coverage of VECSELs for other atomic lines and discuss future development possibilities.

[1] M. Kuznetsov *et al.*, IEEE J. Sel. Top. in Quant. Electronics 5, 3 (1999)

[2] S. Burd *et al.*, Optica 3, 12 (2016)