Digital control of laser modes with an intra-cavity spatial light modulator

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ABSTRACT

In this paper we outline a simple laser cavity which produces customised on-demand digitally controlled laser modes by replacing the end-mirror of the cavity with an electrically addressed reflective phase-only spatial light modulator as a digital addressed holographic end-mirror. We show that on-demand digitally controlled laser modes are possible by changing the phase and amplitude of the computer generated hologram in a form of a grey-scale image on the holographic mirror. We demonstrate that customised digitally controlled laser modes can be generated on-demand by switching to several different spatial modes in real-time with the first the ‘digital laser’.