Two-slab all-optical spring

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Received October 23, 2006; revised December 17, 2006; accepted December 22, 2006;
posted January 4, 2007 (Doc. ID 76366); published February 15, 2007

It is demonstrated that a waveguide consisting of two dielectric slabs may become an all-optical spring when guiding a superposition of two transverse evanescent modes. Both slabs are transversally trapped in stable equilibrium due to the optical forces developed. A condition for stable equilibrium on the wavenumbers of the two modes is expressed analytically. The spring constant characterizing the system is shown to have a maximal value as a function of the equilibrium distance between the slabs and their width.

OCIS codes: 260.2110, 140.7010, 130.2790, 200.4880.