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A monolithic glass bowtie cavity trap for ultracold atoms KEVIN WRIGHT, JESSE EVANS, YANPING CAI, DANIEL ALLMAN, Dartmouth — We have built a monolithic, symmetric bowtie cavity that is optimized for use as an in-vacuum crossed-beam dipole trap for ultracold atoms. The all-glass bonded construction has good passive stability, and is highly compatible with experiments involving large and/or rapidly changing magnetic fields. The hydroxide bonding technique used to assemble the cavity results in bond strengths and vacuum compatibility similar to optical contacting, but with somewhat relaxed tolerances on surface quality and preparation. Furthermore, hydroxide bonding has a long curing time that allows precise optimization of optical alignment during bonding of complex assemblies. We will report on our application of this technique to optical cavity construction, our progress toward trapping and cooling lithium atoms in a ring bowtie cavity, and discuss prospects for coupling the cavity modes to the motion of atoms trapped in the beam intersection region.

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