Behavior of laser initiated z pinch at small current level

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A portable experiment platform is constructed, which can be used for both single wire z pinch and laser initiated z pinch. At the current level of several kiloampere, a series of experiments have been carried out, and the dynamic behavior of laser initiated z pinch is observed. Effects of the following conditions on z pinch motion are studied: gas pressure surrounding the plasma (0.33atm~3atm), material of electrode (such as Ti, Cu, etc), amplitude of the drive current, and the total energy of laser beam (0.5J and 1J). Characteristics of plasma column evolution, such as stable time of plasma column and expansion rate, are calculated based on the captured plasma image. Experimental results under different conditions are compared, and corresponding analyses are performed, too. In next work, MHD simulation and more diagnostic tools will be employed.