Amplification of a Laser Beam for the Fast Ignition of a Thermonuclear Target

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It is proposed to simultaneously compress a thermonuclear target and amplify a laser beam by a single z-pinch discharge. The laser beam is imploded and amplified by a cylindrical convergent shock wave inside a capillary, transforming it into a soft X-ray pulse for the fast ignition of the thermonuclear target. The target is compressed inside a liner by the z-pinch current. The capillary is attached to one end of the cylindrical target, and is protected by a radial wire spoke array fast opening switch against its premature implosion by the convergent shock wave. The z-pinch can be stabilized by placing it into a powerful vortex.

Key words: Fast Ignition; z-Pinch; Laser Amplification.