

Laboratory formation of bipolar jets due to collimation of a wide-angle disk plasma wind embedded in poloidal magnetic fields

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Bipolar jets are ubiquitous in varied astrophysical disc accreting systems. Their formation mechanisms are very significant for understanding the evolution of these systems. It is widely thought that magnetic fields play a key role in the formation of bipolar jets. We will present a laboratory experiment to generate magnetically highly collimated bipolar jets with SGII laser facility. Our experiments exploit an Ω -shaped coil target to generate an expanding plasma and poloidal magnetic fields simultaneously. We observe a bipolar jet with an aspect ratio $\sim 1:24$ from the plasma concentrated at the coil center. Our results demonstrate that a wide-angle disk wind can be collimated into a very narrow bipolar jet by large-scale poloidal magnetic fields.