

## The Formation and Evolution of Negative Central Magnetic Shear Current Profiles on DIII-D

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### *Abstract*

Using the combination of early neutral beam injection, ramping of the plasma current, low electron density, and controlled L–H transitions, robust discharges with negative central magnetic shear are reproducibly obtained on the DIII-D tokamak. The effects of these factors on the formation and evolution of the  $q$  profile during the initial phase of these discharges are documented. Details of the evolution of the inverted  $q$ -profile are obtained from measurements of the internal field pitch using a 16-channel motional Stark effect (MSE) system. Time-dependent MSE data are used to directly construct the profile of the toroidal electric field and allow a straightforward calculation of the non-inductive current density profile.

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