

# Direct measurement of the radial electric field in tokamak plasmas using the Stark effect

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## Abstract

Motional Stark Effect polarimetry (MSE) is a well established technique for measuring the magnetic field pitch angle in tokamaks. By viewing the Stark emission spectrum from two different angles, this technique can also provide local measurements of the plasma radial electric field,  $E_r$ . Simultaneous measurements of the profiles of magnetic field pitch angle and  $E_r$  are presented for the first time in a high-performance DIII-D tokamak plasma. Direct measurement of  $E_r$  is of great importance in fusion research because the suppression of turbulence through  $\mathbf{E}_r \times \mathbf{B}$  velocity shear provides a mechanism to improve energy confinement.

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