Calculating the Source Terms in the Momentum Diffusion Equation[1] YURI PODPALY, JOHN RICE, MATT REINKE, YIJUN LIN, MIT Plasma Science and Fusion Center, DAVID MIKKELSEN, Princeton Plasma Physics Laboratory, IAN HUTCHINSON, MIT Plasma Science and Fusion Center — There have been numerous attempts explain the anomalous transport of toroidal momentum in plasmas. Current methods involve the application of diffusive, proportional to gradient v, and convective, proportional to v, terms in the simple momentum conservation equation. Including these terms, however, does not provide a proper representation of the profile shape of the plasma rotation, so other terms must be included, which could be source or off-diagonal residual stress contributions in the momentum conservation equation. Using the spatially resolving soft x-ray spectrometer at Alcator C-Mod which provides temporally and spatially resolved rotation profiles, and solving the momentum conservation equation, it is possible to quantify the effects of diffusion and convection terms and reveal the spatial and temporal shape of a source required to explain the rotation velocity profiles. This poster focuses on running this analysis on discharges with L-H mode transitions, L-mode rotation inversions, and fast SSEP sweeps, which provide strong changes in the rotation profile.

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