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Normal Mode Approach to Modeling of Feedback Stabilization of the Resistive Wall Mode[1] M.S. CHU, E.J. STRAIT, General Atomics, M.S. CHANCE, L.C. JOHNSON, M. OKABAYASHI, PPPL, A.H. GLASSER, LANL, A.M. GAROFALO, G.A. NAVRATIL, Columbia U. — Modeling of the feedback stabilization of the RWM is studied through a normal mode approach.The normal modes are the eigenmodes of the system with no feedback. The mode structure and growth (damping) rates are experimentally observable. These eigenmodes are sensed by the sensor loops to form a sensor matrix and excited by the external coils to form an excitation matrix. Feasibility of the feedback is determined by a characteristic function with information from the growth and damping rates, the sensor and excitation matrices, together with the feedback logic. The above formulation has been numerically implemented utilizing the DCON and VACUUM codes. The sensor and excitation matrices and the effectiveness of the feedback with different feedback algorithms in the DIII-D geometry are presented. Relevance of results obtained from this approach to experimental observations is also discussed.

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