Talk announcement

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MONA - magnetic oriented modals analysis for electric circuit

This talk adresses one of the fundamental problems in electrical engineering - modelling and simulation of electric circuits. The modified nodal analysis (MNA) is probabaly the most widely used formulation in this context. In its conventional form it relies on electric node potentials and currents across inductors and voltage sources asprimary unknowns. In this talk, we present an alternative model based onmagnetic node potentials and charge differences across capacitors and voltage sources. Due to its magnetic oriented viewpoint, we call the formulation magnetic oriented nodal analysis (MONA). The proposed formulation has the structureof a generalized gradient system which immediately ensures passivity in the absenceof sources. As we will show, the differential-algebraic index of MONA is smaller by one in most cases which facilitates the numerical solution. Some numerical tests will be presented for illustration.