

Analytical modeling of the input admittance of an electric drive for stability analysis purposes

S. Girinon⁽¹⁾, C. Baumann⁽²⁾, H. Piquet⁽¹⁾, and N. Roux⁽¹⁾

⁽¹⁾ Université de Toulouse, Laboratoire PLASMA et Conversion d'Énergie (LAPLACE), CNRS (UMR 5213), INPT, UPS, 2 rue Camichel, BP 7122, 31071 Toulouse Cedex 7, France

⁽²⁾ AIRBUS France S.A.S., 316 Route de Narbonne P.O. BOX M0131/5, 31060 Toulouse Cedex 9, FRANCE

Abstract. Embedded electric HVDC distribution network are facing difficult issues on quality and stability concerns. In order to help in resolving those problems, this paper proposes to develop an analytical model of an electric drive. This self-contained model includes an inverter, its regulation loops and the PMSM. After comparing the model with its equivalent (abc) averaged and full model, the study focuses on frequency analysis. The association with an input filter helps in expressing stability of the whole assembly by means of Routh-Hurwitz criterion.