IAEA FEC 2014

Contribution ID: **646** Type: **Poster**

# Global Gyrokinetic Modeling of Geodesic Acoustic Modes and Shear Alfvén Instabilities in ASDEX Upgrade

*Tuesday 14 October 2014 08:30 (4 hours)*

In this work, we investigate theoretically the dynamics of global instabilities observed in ASDEX Upgrade (AUG) by means of collisionless numerical simulations. We focus in particular on geodesic acoustic modes (GAM) and shear Alfven instabilities. The numerical tools we use are the codes NEMORB (nonlinear global gyrokinetic PIC), LIGKA (linear global gyrokinetic) and XHMGC (nonlinear global hybrid). In the first part of this work, results of axisymmetric simulations of GAMs with gyrokinetic codes NEMORB and LIGKA with AUG equilibrium profiles are shown. In the second part, we show results of axisymmetric electromagnetic simulations with NEMORB and LIGKA in the presence of an EP population. Finally, in the third part, we show results of single-n (with n the toroidal mode number) numerical simulations of shear Alfven instabilities with NEMORB, LIGKA and XHMGC. Comparisons with analytical theory and experimental data are also shown, for each case of interest.

## Country or International Organisation

Germany

## Paper Number

EX/P1-18

**Author:** Dr BIANCALANI, Alessandro (Max-Planck-Institut für Plasmaphysik Euratom Association, Garching, Germany)

**Co-authors:** Dr BOTTINO, Alberto (Max-Planck-Institut für Plasmaphysik, Garching, Germany); Dr SCOTT, Bruce (Max-Planck-Institut für Plasmaphysik, Garching, Germany); Dr DI TROIA, Claudio (Associazione Euratom-ENEA sulla Fusione, C.P. 65-I-00044-Frascati, Rome, Italy); Dr ZARZOSO, David (Max-Planck-Institut für plasmaphysik, 85748 Garching, Germany); ZONCA, Fulvio (Associazione EURATOM-ENEA sulla Fusione); Dr CONWAY, Garrard (Max-Planck-Institut fuer Plasmaphysik); Dr VLAD, Gregorio (Associazione Euratom-ENEA sulla Fusione, C.P. 65-I-00044-Frascati, Rome, Italy); Dr SIMON, Patrick (Max-Planck-Institut für Plasmaphysik, Garching, Germany); Dr LAUBER, Philipp (Max-Planck-Institut für Plasmaphysik, Garching, Germany); Dr BRIGUGLIO, Sergio (Associazione Euratom-ENEA sulla Fusione, C.P. 65-I-00044-Frascati, Rome, Italy); Dr WANG, Xin (Max--Planck-Institute für Plasmaphysik, 85748 Garching, Germany)

**Presenter:** Dr BIANCALANI, Alessandro (Max-Planck-Institut für Plasmaphysik Euratom Association, Garching, Germany)

**Session Classification:** Poster 1