



**NATIONAL TECHNICAL UNIVERSITY OF ATHENS**  
SCHOOL OF ELECTRICAL AND COMPUTER ENGINEERING

Fusion Research Team

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Head of Research Team: Kyriakos Hizanidis, Professor  
Address: Iroon Politechniou 9, 157 73 Zografou, Athens, Greece  
Telephone: +30 210 772 3685, +30 210 772 2469-70  
Fax: +30 210 772 3513  
e-mail: kyriakos@central.ntua.gr

Staff:

- J. Vomvouridis - Professor
- J. Roumeliotis - Professor
- H. Glytsis - Professor
- A. Kladas - Associate Professor
- A. Lazaros - Postdoc Researcher
- C. Iatrou - Postdoc Researcher
- I. Sandberg - Postdoc Researcher
- Y. Kominis - Postdoc Researcher
- J. Pagonakis - Postdoc Researcher
- C. Avramidis - Postdoc Researcher
- G. Anastasiou - Doctoral Candidate
- A. Anastasiadis - Researcher

Scientific Interests:

- Electrostatic and electromagnetic effects on an electron beam, in particular in gyrotron system configuration
- Analytical and numerical investigations on the excitation and evolution of linear and non-linear drift-type instabilities
- Non-resonant suppression of MHD modes (such as the sawtooth instability and the neoclassical tearing mode)

Publications in Fusion:

- I. Sandberg, H. Isliker, V. P Pavlenko, K. Hizaridis, G. L. Walsh, S. J. Webb, J. P. Pavlenko, K. Hizaridis, T. A. M. Nicholson, J. R. Kitchner, S. J. Webb, I. Sandberg, and A. Lazaros, "Explicit threshold of the toroidal instability in tokamak plasmas," *Plasma Phys. Contr. Fusion*, vol. 43, p. 1059, 2001.
- A. Lazaros, A. Shimizu, N. Yoshimura, K. Matsuyama, S. Okazaki, and I. Sandberg, "Stability of the electron temperature gradient in tokamak plasmas," *Plasma Phys. Contr. Fusion*, vol. 43, p. 1059, 2001.
- I. Sandberg, "Explicit threshold of the toroidal instability in tokamak plasmas," *Plasma Phys. Contr. Fusion*, vol. 43, p. 1059, 2001.
- I. Sandberg, H. Isliker, V. P Pavlenko, K. Hizaridis, and G. L. Walsh, "Stability of the electron temperature gradient in tokamak plasmas," *Plasma Phys. Contr. Fusion*, vol. 43, p. 1059, 2001.
- Y. Kominis, O. Dumbrajs, K. A. Avramides, K. Hizaridis, and I. Sandberg, "Design and simulation of a gyrotron for the ITER tokamak," *IEEE Trans. Plasma Sci.*, vol. 31, p. 775, 2003.
- K. A. Avramides C. T. Iliadis, "Design and simulation of a gyrotron for the ITER tokamak," *IEEE Trans. Plasma Sci.*, vol. 31, p. 775, 2003.
- J. G. Pagonakis and J. E. Viotovitsis, "Uniformly magnetized plasma in a cylindrical geometry," *IEEE Trans. Plasma Sci.*, vol. 31, p. 775, 2003.

Annual Reports:

- Annual Report 1999-2000 [2a1\) Non-cylindrical e -beam for quasi-optical gyrotron](#)  
[2a2\) Self-consistent 3-D electrostatic code for gyrotron beam tunnel](#)  
[2a4\) Coaxial and harmonic gyrotrons](#)  
[2c4\) Non-resonant stabilisation of sawteeth and tearing modes by superthermal particles \(ions and electrons\) during ICRH and ECRH](#)
- Annual Report 2001 [2a1\) Non-cylindrical e -beam for quasi-optical gyrotron](#)  
[2a2\) Self-consistent 3-D electrostatic code for gyrotron beam tunnel](#)  
[2a4\) Coaxial and harmonic gyrotrons](#)  
[2c3\) Stochastic modelling of transport phenomena](#)  
[2c4\) Assessment of the theory of non-resonant stabilization by superthermal particles](#)
- Annual Report 2002 [2a1\) Non-cylindrical e -beam for quasi-optical gyrotron](#)  
[2a2\) Self-consistent 3-D electrostatic code for gyrotron beam tunnel](#)  
[2a4\) Coaxial and harmonic gyrotrons](#)  
[2c4\) Experimental stabilization of sawtooth and NTM by superthermal particles](#)
- Annual Report 2003 [2a1\) Application of sheet e-beam to quasi-optical gyrotron](#)  
[2a2\) Self-consistent 3-D electrostatic code for gyrotron beam tunnel](#)  
[2a4\) Coaxial and harmonic gyrotrons](#)  
[2c4\) Experimental demonstration of sawtooth and NTM stabilization by superthermal particles \(ions and electrons\) during ICRH and ECRH](#)
- Annual Report 2004 [2a1\) Application of sheet e-beam to quasi-optical gyrotron](#)

[2a2\) Self-consistent 3-D electrostatic code for gyrotron beam tunnel](#)

[2a4\) Coaxial and harmonic gyrotrons](#)

[2a5\) Chaotic electron dynamics in gyrotron resonators](#)

[2c2\) MHD turbulent transport in plasmas](#)

- [Annual Report 2005](#)      [2a1\) Application of sheet e-beam to quasi-optical gyrotron](#)

[2a2\) Self-consistent 3-D electrostatic code for gyrotron beam tunnel](#)

[2a4\) Coaxial and harmonic gyrotrons](#)

[2a5\) Chaotic electron dynamics in gyrotron resonators](#)

[2c1\) Transport and chaos in fusion plasmas](#)

[2c2\) MHD turbulent transport in plasmas](#)

[2c4\) Saw-tooth and NTM stabilization by super-thermal particles](#)

- [Annual Report 2006](#)      [2a1\) Application of sheet e-beam to quasi-optical gyrotrons](#)

[2a2\) Self-consistent 3-D electrostatic code for gyrotron beam tunnel](#)

[2a4\) Coaxial and harmonic gyrotrons](#)

[2a5\) Chaotic electron dynamics in gyrotron resonators](#)

[2c3\) TM avoidance in ASDEX-Upgrade and TEXTOR by early application of EC waves](#)

[2c4\) Transport and chaos in fusion plasmas during ECRH](#)

[2c8\) Turbulence and transport phenomena](#)

- [Annual Report 2007](#)      [1.2 Energy and particle confinement/transport](#)

[1.3 MHD stability and plasma control](#)

[1.5 Physics of plasma heating and current drive](#)

[2.1 Heating and current drive systems](#)

[2.1-3. Coaxial and harmonic gyrotrons](#)

[2.1-4. Chaotic electron dynamics in gyrotron resonators](#)

[2.1-5. Novel configurations for a gyrotron collector](#) <

- [Annual Report 2008](#)      [1.2.1 Turbulence and transport phenomena](#)

[1.5.1. ECRH-ECCD and transport in fusion plasmas](#)

[2.1.1 Investigation of new concepts for high power microwave generation for ECRH: Application of sheet e-beam to increase output power of gyrotrons](#)

[2.1.2 Gyrotron interaction and cavity design](#)

[2.1.4. Chaotic and Hamiltonian electron dynamics in gyrotrons](#)

[3.4.2 Turbulence and anomalous transport phenomena](#)

- [Annual Report 2009](#)      [1.2.1. Turbulence and transport phenomena](#)

[1.3.1. ECRH for MHD control](#)

[1.5.1. ECRH-ECCD and transport in fusion plasmas](#)

[2.1.1 Investigation of new concepts for high power microwave generation for ECRH: Application of sheet e-beam to increase output power of gyrotrons](#)

[2.1.2 Gyrotron interaction and cavity design](#)

[2.1.4. Chaotic and Hamiltonian electron dynamics in gyrotrons](#)

[2.2.2 Diagnostic methods for the measurement of electron temperature](#)

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