## Attaining Tokamak level performance through plasma density profile shaping at Wendelstein 7-X

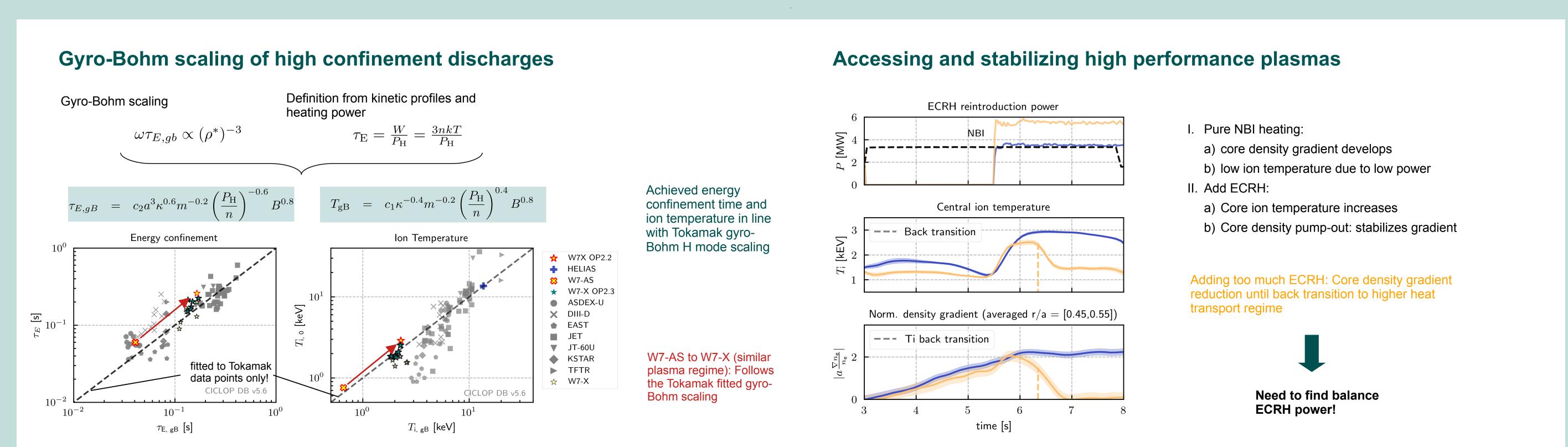


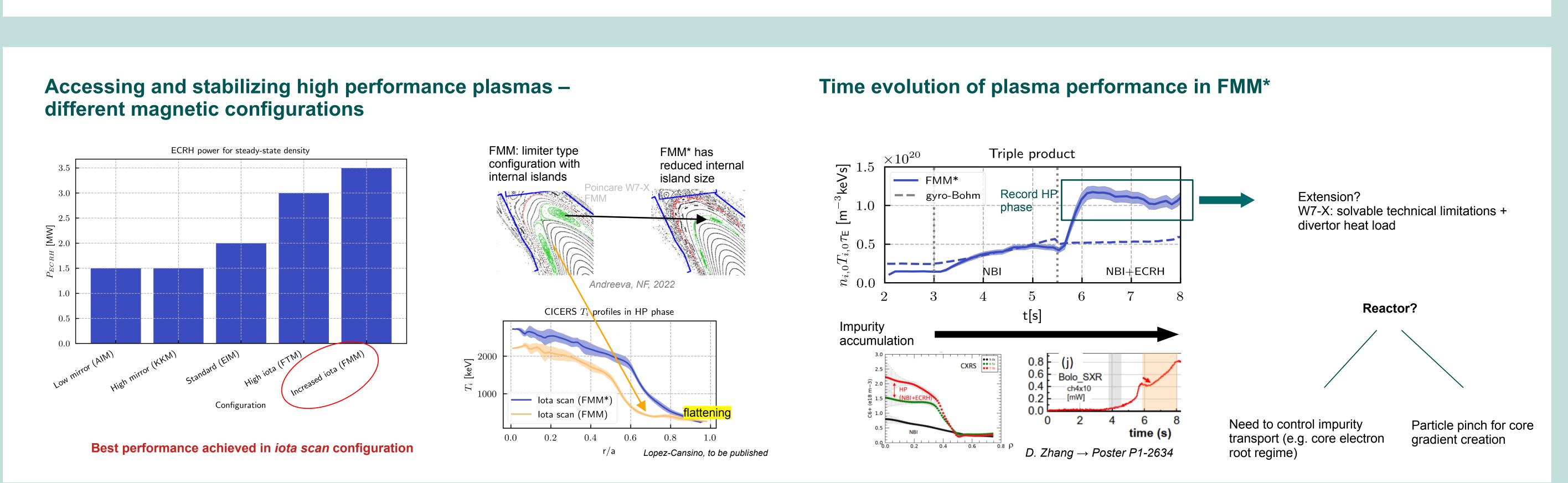
S. Bannmann<sup>1\*</sup>, O. Ford<sup>1</sup>, S.A. Bozhenkov<sup>1</sup>, T. Stange<sup>1</sup>, R. Lopez Cansino<sup>2</sup>, A. Langenberg<sup>1</sup>, M. Wappl<sup>1</sup>, J. Brunner<sup>1</sup>, G. Fuchert<sup>1</sup>, T. Gonda<sup>1</sup>, D. Hartmann<sup>1</sup>, J. Knauer<sup>1</sup>, H.P. Laqua<sup>1</sup>, P. McNeely<sup>1</sup>, N. Pablant<sup>1</sup>, E. Pasch<sup>1</sup>, P. Poloskei<sup>1</sup>, K. Rahbarnia<sup>1</sup>, N. Rust<sup>1</sup>, F. Warmer<sup>1</sup>, R.C. Wolf<sup>1</sup>, the W7X-Team

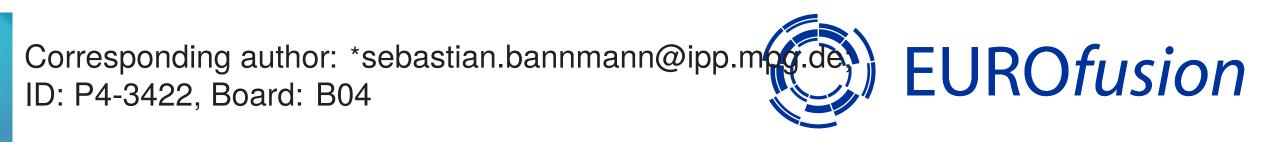
<sup>1</sup>Max-Planck-Institut für Plasmaphysik, 17491 Greifswald, Germany

<sup>2</sup>Department of Atomic, Molecular and Nuclear Physics, University of Seville, Spain

## HIGH PERFORMANCE DISCHARGES AT W7-X









TRIPLE PRODUCT W7-X vs. Tokamak H mode performance More stored magnetic New record triple product achieved at W7-X JT-60U ASDEX-U W7-X 2.3 energy than W7-X W7-X 2.2 DIII-D  $1.10 \pm 0.07 \ 10^{20} \mathrm{m}^{-3} \mathrm{keVs}$  $\overline{n_{i,0}T_{i,0} au_{
m E}}$ W7-AS **EAST** TFTR  $1.18 \pm 0.12 \ 10^{20} \mathrm{m}^{-3} \mathrm{keVs}$  $n_{i,0}T_{i,0} au_{
m E}|^{
m max}$ W7-X **JET** 10 <sup>3</sup>keVs  $E_{B,\mathsf{W7}}$  $[\times 10^{20} \mathrm{m}^{-}$  $t_{\rm HP}^{\rm i} < 2 au_E$  $10^{0}$ W7-X achieved competitive triple product given its stored magnetic 1/2  $\bigstar$ energy 1/4Less stored magnetic  $\Rightarrow$ energy than W7-X CICLOP DB V5.6  $E_B = V B_0^2 / 2\mu_0$  $10^{3}$  $10^{0}$  $10^{2}$  $10^{-1}$  $10^{1}$ CICLOP DB High performance duration [s] [Litaudon, Nuclear Fusion, 2023]