

## REFERENCES

- <sup>1</sup>D. Zarzoso, Y. Sarazin, X. Garbet, R. Dumont, A. Strugarek, J. Abiteboul, T. Cartier- Michaud, G. Dif-Pradalier, Ph. Ghendrih, V. Grandgirard, G. Latu, C. Passeron, and O. Thomine, Phys. Rev. Lett. 110, 125002 (2013).
- <sup>2</sup>R. J. Dumont, D. Zarzoso, Y. Sarazin, X. Garbet, A. Strugarek, J. Abiteboul, T. Cartier- Michaud, G. Dif-Pradalier, Ph. Ghendrih, J.-B. Girardo, V. Grandgirard, G. Latu, C. Passeron, and O. Thomine, Plasma Phys. Control. Fusion 55, 124012 (2013).
- <sup>3</sup>D. Zarzoso et al., Nucl. Fusion 57, 072011 (2017).
- <sup>4</sup>The Exascale Computing Project, (The U.S. Department of Energy, <https://www.exascaleproject.org/exascale-computing-project/>).
- <sup>5</sup>M. Barnes, arXiv preprint arXiv:0901.2868 (2009).
- <sup>6</sup>G. G. Plunk, arXiv preprint arXiv:0903.1091 (2009).
- <sup>7</sup>I. G. Abel, G. G. Plunk, E. Wang, M. Barnes, S. C. Cowley, W. Dorland, and A. A. Schekochihin, Reports on Progress in Physics 76, 116201 (2013).
- <sup>8</sup>F. Zonca, L. Chen, S. Briguglio, G. Fogaccia, G. Vlad, and X. Wang, New J. Phys. 17, 013052 (2015).
- <sup>9</sup>F. Zonca, L. Chen, S. Briguglio, G. Fogaccia, A. V. Milovanov, Z. Qiu, G. Vlad, and X. Wang, Plasma Phys. Control. Fusion 57, 014024 (2015).
- <sup>10</sup>L. Chen and F. Zonca, Rev. Mod. Phys. 88, 015008 (2016).
- <sup>11</sup>ER15 Project “Theory and simulation of energetic particle dynamics and ensuing collective behaviors in fusion plasmas”, (P.I. F. Zonca, <https://www2.euro-fusion.org/erwiki/index.php?title=ER15-ENEA-03>).
- <sup>12</sup>ER17 Project “Nonlinear interaction of Alfvénic and turbulent fluctuations in burning plasmas”, (P.I. Ph. Lauber, [http://www2.ipp.mpg.de/~pwl/NAT/ENR\\_NAT.html](http://www2.ipp.mpg.de/~pwl/NAT/ENR_NAT.html)).
- <sup>13</sup>C. Hsu and D. Sigmar, Phys. Fluids B 4, 1492 (1992).
- <sup>14</sup>D. J. Sigmar, C. T. Hsu, R. B. White, and C. Z. Cheng, Phys. Fluids B 4, 1506 (1992).
- <sup>15</sup>W. W. Heidbrink, Phys. Plasmas 15, 055501 (2008).
- <sup>16</sup>C. Angioni, A. G. Peeters, G. V. Pereverzev, A. Bottino, J. Candy, R. Dux, E. Fable, T. Hein, and R. E. Waltz, Nucl. Fusion 49, 055013 (2009).
- <sup>17</sup>W. W. Heidbrink, M. A. Van Zeeland, M. E. Austin, E. M. Bass, K. Ghantous, N. N. Gorelenkov, B. A. Grierson, D. A. Spong, and B. J. Tobias, Nucl. Fusion 53, 93006 (2013).
- <sup>18</sup>R. E. Waltz and E. M. Bass, Nucl. Fusion 54, 104006 (2014).
- <sup>19</sup>H. Sheng, R. E. Waltz, and G. M. Staebler, Phys. Plasmas 24, 072305 (2017).
- <sup>20</sup>H. L. Berk, B. N. Breizman, J. Fitzpatrick, and H. V. Wong, Nucl. Fusion 35, 1661 (1995).
- <sup>21</sup>K. Ghantous, N. N. Gorelenkov, H. L. Berk, W. W. Heidbrink, and M. A. V. Zeeland, Phys. Plasmas 19, 092511 (2012).
- <sup>22</sup>K. Ghantous, H. L. Berk, and N. N. Gorelenkov, Phys. Plasmas 21, 032119 (2014).
- <sup>23</sup>R. B. White, N. Gorelenkov, W. W. Heidbrink, and M. A. Van Zeeland, Phys. Plasmas 17, 056107 (2010).
- <sup>24</sup>R. B. White, N. Gorelenkov, W. W. Heidbrink, and M. A. Van Zeeland, Plasma Phys. Control. Fusion 52, 045012 (2010).
- <sup>25</sup>C. Collins, W. Heidbrink, M. Austin, G. Kramer, D. Pace, C. Petty, L. Stagner, M. Van Zeeland, R. White, Y. Zhu, and DIII-D team, Phys. Rev. Lett. 116, 095001 (2016).
- <sup>26</sup>W. W. Heidbrink, C. S. Collins, M. Podestà, G. J. Kramer, D. C. Pace, C. C. Petty, L. Stagner, M. A. Van Zeeland, R. B. White, and Y. B. Zhu, Physics of Plasmas 24, 056109 (2017).
- <sup>27</sup>C. S. Collins, W. W. Heidbrink, M. Podestà, R. B. White, G. J. Kramer, D. C. Pace, C. C. Petty, L. Stagner, M. A. Van Zeeland, Y. B. Zhu, and The DIII-D Team, Nucl. Fusion 57, 086005 (2017).
- <sup>28</sup>M. Podestà, M. Gorelenkova, and R. B. White, Plasma Phys. Control. Fusion 56, 055003 (2014).
- <sup>29</sup>M. Podestà, M. Gorelenkova, E. D. Fredrickson, N. N. Gorelenkov, and R. B. White, Phys. Plasmas 23, 056106 (2016).
- <sup>30</sup>M. Schneller, Ph. Lauber, and S. Briguglio, Plasma Phys. Control. Fusion 58, 014019 (2016).
- <sup>31</sup>N. Carlevaro, A. V. Milovanov, M. V. Falessi, G. Montani, D. Terzani, and F. Zonca, Entropy 18, 143 (2016).
- <sup>32</sup>L. Chen and F. Zonca, Phys. Plasmas 20, 055402 (2013).
- <sup>33</sup>F. Zonca, L. Chen, Z. Qiu, and the NLED Team, Tutorial Invited Talk at the 17th European Fusion

Theory Conference, Athens, October 9-12. (2017).

- <sup>34</sup>Ph. Lauber, “The NLED reference case”, ASDEX Upgrade Ringberg Seminar (2016), (Ph. Lauber et al., NLED-AUG reference case, [http://www2.ipp.mpg.de/~pwl/NLED\\_AUG/data.html](http://www2.ipp.mpg.de/~pwl/NLED_AUG/data.html)).
- <sup>35</sup>L. Horváth, G. Papp, Ph. Lauber, G. Por, A. Gude, V. Igoshine, B. Geiger, M. Maraschek, L. Guimarães, V. Nikolaeva, G. I. Pokol, and the ASDEX Upgrade Team, Nucl. Fusion 56, 112003 (2016).
- <sup>36</sup>E. A. Frieman and L. Chen, Phys. Fluids 25, 502 (1982).
- <sup>37</sup>A. J. Brizard and T. S. Hahm, Rev. Mod. Phys. 79, 421 (2007).
- <sup>38</sup>M. V. Falessi, arXiv preprint arXiv:1701.02202 (2017).
- <sup>39</sup>M. V. Falessi and F. Zonca, submitted to Phys. Plasmas (2017).
- <sup>40</sup>F. L. Hinton and R. D. Hazeltine, Rev. Mod. Phys. 48, 239 (1976).
- <sup>41</sup>A. Pizzuto et al., (ISBN: 978-88-8286-318-0).
- <sup>42</sup>J. Decker, Y. Peysson, A. J. Brizard, and F.-X. Duthoit, Phys. Plasmas 17, 112513 (2010).
- <sup>43</sup>A. Bierwage and L. Chen, Commun. Comput. Phys 4, 457 (2010).
- <sup>44</sup>A. V. Milovanov and L. M. Zelenyi, Phys. Rev. E 64, 05201 (2001).
- <sup>45</sup>G. M. Zaslavsky, Phys. Rep. 371, 461 (2002).
- <sup>46</sup>R. Kleiber, Theory of Fusion Plasmas: Joint Varenna-Lausanne Int. Workshop (2006).
- <sup>47</sup>S. D. Pinches, L. C. Appel, J. Candy, S. E. Sharapov, H. L. Berk, D. Borba, B. N. Breizman, T. Hender, K. I. Hopcraft, G.T.A. Huysmans, and W. Kerner, Comput. Phys. Commun. 111, 131 (1998).
- <sup>48</sup>T. Hayward-Schneider et al, Poster presented at the IAEA Technical Meeting on Energetic Particles in Magnetic Confinement Systems, Princeton, NJ (USA), September 5-8 (2017), (<https://nucleus.iaea.org/sites/fusionportal/Shared%20Documents/EP%2017th/Posters/P-10.pdf>).
- <sup>49</sup>G. Fogaccia, S. Briguglio, and G. Vlad, in *Proceedings of the 40.th EPS Conference on Plasma Physics, Espoo, Finland, 1 - 5 July, (2013)*, ECA, Vol. 37D (EPS, 2013) pp. CD-ROM file P4.151.
- <sup>50</sup>S. Jolliet, A. Bottino, P. Angelino, R. Hatzky, T. Tran, B. Mcmillan, O. Sauter, K. Appert, Y. Idomura, and L. Villard, Computer Physics Communications 177, 409 (2007).
- <sup>51</sup>A. Bottino, T. Vernay, B. Scott, S. Brunner, R. Hatzky, S. Jolliet, B. F. McMillan, T. M. Tran, and L. Villard, Plasma Phys. Control. Fusion 53, 124027 (2011).
- <sup>52</sup>A. Biancalani, A. Bottino, C. Ehrlacher, V. Grandgirard, G. Merlo, I. Novikau, Z. Qiu, E. Sonnendrücker, X. Garbet, T. Görler, S. Leerink, F. Palermo, and D. Zarzoso, Phys. Plasmas 24, 062512 (2017).
- <sup>53</sup>A. Biancalani, I. Chavdarovski, Z. Qiu, A. Bottino, D. Del Sarto, A. Ghizzo, O. Gürcan, P. Morel, and I. Novikau, accepted for publication in J. Plasma Phys., [arxiv.org/abs/1709.05998](https://arxiv.org/abs/1709.05998) (2017).
- <sup>54</sup>A. Biancalani, A. Bottino, S. Briguglio, A. Könies, Ph. Lauber, A. Mishchenko, E. Poli, B. D. Scott, and F. Zonca, Phys. Plasmas 23, 012108 (2016).
- <sup>55</sup>M. D. J. Cole, A. Biancalani, A. Bottino, R. Kleiber, A. Könies, and A. Mishchenko, Phys. Plasmas 24, 022508 (2017).
- <sup>56</sup>A. Biancalani, A. Bottino, M. Cole, C. Di Troia, Ph. Lauber, A. Mishchenko, B. Scott, and F. Zonca, Plasma Phys. Control. Fusion 59, 054004 (2017).
- <sup>57</sup>S. Briguglio, G. Vlad, F. Zonca, and C. Kar, Phys. Plasmas 2, 3711 (1995).
- <sup>58</sup>S. Briguglio, F. Zonca, and G. Vlad, Phys. Plasmas 5, 3287 (1998).
- <sup>59</sup>X. Wang, S. Briguglio, L. Chen, C. Di Troia, G. Fogaccia, G. Vlad, and F. Zonca, Phys. Plasmas 18, 052504 (2011).
- <sup>60</sup>D. Zarzoso et al., Invited Talk at the IAEA Technical Meeting on Energetic Particles in Magnetic Confinement Systems, Princeton, NJ (USA), September 5-8. (2017).
- <sup>61</sup>C. C. Hegna and A. Bhattacharjee, Phys. Rev. Lett. 63, 2056 (1989).
- <sup>62</sup>H. Cai, S. Wang, Y. Xu, J. Cao, and D. Li, Phys. Rev. Lett. 106, 075002 (2011).
- <sup>63</sup>H. Cai and G. Fu, Phys. Plasmas 19, 072506 (2012).
- <sup>64</sup>H. Cai, Nucl. Fusion 56, 126016 (2016).
- <sup>65</sup>W. A. Hornsby, P. Migliano, R. Buchholz, D. Zarzoso, F. J. Casson, E. Poli, and A. G. Peeters, Plasma Phys. Control. Fusion 57, 054018 (2015).
- <sup>66</sup>W. A. Hornsby, P. Migliano, R. Buchholz, L. Kroenert, A. Weikl, A. G. Peeters, D. Zarzoso, E. Poli, and F. J. Casson, Phys. Plasmas 22, 022118 (2015).
- <sup>67</sup>W. A. Hornsby, P. Migliano, R. Buchholz, S. Grosshauser, A. Weikl, D. Zarzoso, F. J. Casson, E. Poli, and A. G. Peeters, Plasma Phys. Control. Fusion 58, 014028 (2016).