Publications and Presentations

• Annual Progress Reports

• Publications
  • 2020
  • 2019
  • 2018

• Presentations
  • 2020
  • 2019
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You may also be interested in publications of our prior project on plasma surface interactions.

Annual Progress Reports

• 2018 Annual Report (Year 1), submitted 1 June 2018

• 2019 Annual Report (Year 2), submitted August 2019

• 2020 Annual Report (Year 3), submitted May 2020

Publications

• 2020
  • Wael R. Elwasif; Ane Lasa; Philip C. Roth; Timothy Reed Younkin; Mark R. Cianciosa, Nested Workflows for Loosely Coupled HPC Simulations, 2019 IEEE/ACIS 18th International Conference on Computer Systems and Applications (AICCSA), Abu Dhabi, UAE, 2019, pp. 1-8

• 2019
  • J. Guterl, R. D. Smirnov and P. Snyder, Effects of surface processes on hydrogen outgassing from metal in desorption experiments, Nuclear Fusion 59 (8): 096042 (2019).


- J. Gutier, C. Johnson, D. Ennis, S. Loch and P. B. Snyder, Effects of the Chodura sheath on tungsten ionization and emission in tokamak divertors, Contributions to Plasma Physics (2019).

### 2018

- Smith, C.W., Granzow, B., Diamond, G., Ibanez, D., Sahni, O., Jansen, K.E. and Shephard, M.S., Immemory integration of existing software components for parallel adaptive unstructured mesh workflows. Concurrency and Computation: Practice and Experience, 30(18) e4510, 2018

### Presentations

#### 2020

#### 2019


• Tiernan Casey, Khachik Sargsyan, Uncertainty Quantification Workflows in Fusion Plasma Surface Interaction Modeling, 61st Annual Meeting of the APS Division of Plasma Physics, Fort Lauderdale, Florida, October 21-25, 2019

• Chonglin Zhang, Gokapakar Perumplly, Gerrett Diamond, Cameron Smith, Onkar Sahni, Agnieszka Truszowska, Mark Shephard, “An Unstructured Mesh Based Infrastructure for Exascale PIC Simulations”, 61st Annual Meeting of the APS Division of Plasma Physics, Fort Lauderdale, Florida, October 21-25, 2019


• Mohammad Mustafa, Davide Curreli, Pablo Seleson, Cory Hauck, David Bernholdt, Verification and UQ activities of the Particle-In-Cell code hPIC for Near Surface Plasma Conditions, Bull. Am. Phys. Soc. 61th Annual Meeting of the APS Division of Plasma Physics, C07.03, Fort Lauderdale, October 21-25, 2019


• Jon Drobny, Davide Curreli, Particle-particle simulations of plasma-material interactions, Bull. Am. Phys. Soc. 61th Annual Meeting of the APS Division of Plasma Physics, PO6.11, Fort Lauderdale, Florida, October 21-25, 2019

• Davide Curreli, Multi-Physics Modeling of Plasma- Surface Interactions in ITER (invited), International School on Cold Plasmas: Fundamentals and Applications, Ettore Majorana Foundation and Centre for Scientific Culture, Erice, Sicily, Sept 12, 2019


• J. Gutier, S. Bringueir, R.D. Smirnov, P. Snyder, Characterization of wall response to plasma fluctuations in tokamak, 17th International Conference on Plasma-Facing Materials and Components for Fusion Applications, Eindhoven, the Netherlands, May 21-24, 2019


• Tim Younkin, Khachik Sargsyan, Tiernan Casey, Habib Nasri Najm, Russ Doerner, Daisuke Nishijima, David L Green, John Canik, Ane Lasa, Philip C Roth, Davide Curreli, Jon T Drobny, Daisuke Nishijima, John Canik, Ane Lasa, Philip C Roth, Davide Curreli, Jon T Drobny, David L Green, Philip C Roth, Tim Younkin, Brian Wirth, Quantification on the Effect of Uncertainty On Impurity Migration In PICSES-A Simulated With GTR, American Physical Society Division of Plasma Physics Annual Meeting, Portland, Oregon, November 7, 2018.


• Robert D Kolasinski, Dwaipayan Dasgupta, Josh A Whaley, Aaron Engel, Frances I Allen, Dean Alan Buchenauer, Dimitrios Maroudas, Brian Wirth, Effects of helium plasmas on tungsten surfaces characterized by helium ion microscopy, ion channeling, and in-situ spectroscopic ellipsometry, American Physical Society Division of Plasma Physics Annual Meeting, Portland, Oregon, November 7, 2018.


• Russell Doerner, Sergei Krasheninnikov, Matthew Baldwin, Daisuke Nishijima, Marlene Patino, Using 3He-containing plasma to track the motion of helium atoms in tungsten, American Physical Society Division of Plasma Physics Annual Meeting, Portland, Oregon, November 7, 2018.

• Andrei I Smolyakov, Sergei Krasheninnikov, SOL ballooning instabilities due to sheath boundary conditions and X-point geometry, American Physical Society Division of Plasma Physics Annual Meeting, Portland, Oregon, November 6, 2018.


• Davide Curreli, Jon T Drobny, Ane Lasa, Sophie Blondel, John Canik, David L Green, Tim Younkin, Brian Wirth, Coupled PIC-BCA simulations of the near-surface plasma at the ITER Outer Target, American Physical Society Division of Plasma Physics Annual Meeting, Portland, Oregon, November 6, 2018.

• John Canik, Ane Lasa, Sophie Blondel, Mark R Cianciosa, Davide Curreli, Jon T Drobny, Wael Elwasif, David L Green, Philip C Roth, Tim Younkin, Brian Wirth, Coupled PIC-BCA simulations of the near-surface plasma at the ITER Outer Target, American Physical Society Division of Plasma Physics Annual Meeting, Portland, Oregon, November 6, 2018.


• M.S. Shephard, E. Yoon, E.S. Seol, A. Truszkowska, G. Perumpilly, O. Sahni, W. Tobin, Distributed Mesh Infrastructure for Particle-in-Cell Simulations, APS DPP meeting, Portland, OR, Nov. 6, 2018.

• PSI SciDAC: Predicting the Performance and Impact of Dynamic PFC Surfaces- Brian Wirth, SciDAC PI Meeting 2018, Rockville, Maryland.


• Plasma Surface Interactions SciDAC: Dynamic plasma material surface interactions at the edge of a magnetically confined fusion reactor - Jon T Drobny, David L Green, Robert D Kolasinski, Brian D Wirth, Daveel Dorr, Dwaipayan Dasgupta, Portland, Oregon, November 6, 2018.

• Xolotl: a cluster dynamics code to predict gas bubble evolution in solids - Sophie Blondel, invited presentation at The 2018 Computer Simulation of Radiation Effects in Solids (COSIRES), Shanghai, China.


• Illustrative examples of analysis and modeling of impurity erosion and redeposition experiments in DIII-D with integrated PPM models, presented in part at the 23rd International Conference on Plasma Surface Interactions in Controlled Fusion Devices 2018, Princeton, New Jersey.
• **Taming the Electrostatic Alfven Wave and Ampere Cancellation Problems** - Ilon Joseph, Transport Task Force Workshop (TTF) 2018, San Diego, California.
• Hydrogen retention in tungsten with self-induced trap formation - Roman Smirnov, poster presentation at the 23rd International Conference on Plasma Surface Interactions in Controlled Fusion Devices (PSI) 2018, Princeton, New Jersey.
• **DFT/MD simulations of H-He interactions, trapping and binding below W surfaces** - Brian Wirth, 25th Meeting of the ITPA Div-SOL, Chengdu China, 1 February 2018
• **W surface evolution modeling towards the onset of fuzz** - Brian Wirth, 25th Meeting of the ITPA Div-SOL, Chengdu China, 1 February 2018
• **Basic physics of the first wall** - Roman Smirnov, invited tutorial talk at the BOUT++ Workshop 2018, Livermore, California.

**2017**

• Impurity Migration Simulation of PISCES-A He Exposed Tungsten With GITR - Tim Younkin APS-DPP 2017, Milwaukee, Wisconsin.
• Calculations of Helium Bubble Evolution in the PISCES Experiments with Cluster Dynamics - Sophie Blondel, APS-DPP 2017, Milwaukee, Wisconsin.
• Overview of modeling plasma surface interactions in tungsten with a focus on connecting computational predictions to experimental observations - Brian Wirth, plenary presentation at the 18th International Conference on Fusion Reactor Materials, Aomori, Japan, 10 November 2017.