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Chenhui Qu

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Education

02/2016 - present	University of Michigan, Ann Arbor, Ph.D., Electrical Engineering	Advisor: Prof. Mark J. Kushner
09/2014 - 02/2016	University of Michigan, Ann Arbor, M.S., Electrical Engineering	Advisor: Prof. Mark J. Kushner GPA: 3.61/4.0
09/2010 - 06/2014	Dalian University of Technology B.S., Applied Physics	Advisor: Prof. Yuanhong Song GPA: 3.25/4.0

Publication

Chenhui Qu, Peng Tian, Abbas Semnani and Mark Kushner *Properties of arrays of microplasmas: application to control of electromagnetic waves* 2017 Plasma Sources Sci. Technol. **26** 105006

Xiao-min Nie, Bo-yang Shao, **Chen-hui Qu** and Ling Zhou *Simulation of Three-spin interaction in coupled cavities chain* 2013 International Journal of Theoretical Physics **52** 3011

Thesis

B.S. Thesis: *Wake-effect for electrons travel through carbon nanotube,* Dalian University of Technology, Liaoning, China, June 2016.

Research Projects

07/2017-present Computational investigation of triple frequency capacitively coupled plasma (TF-CCP) sustained by $Ar/CF_4/O_2$ feedstock species using Hybrid Plasma Equipment Model (HPEM).

- Investigated spatial electron energy distribution (EED) and heating mechanism in TF-CCP.
- Investigated gap length, power, pressure, frequency and phase's effect on TF-CCP, and possible ways to optimize plasma behavior for industrial application.

11/2017-present Computational investigation on Ar/Cl_2 inductively coupled plasma (ICP) driven by high-low pulsed power.

- Investigated the sensitivity of the plasma properties at different positions.

- Investigated plasma instability with different input power, duty cycle, pulse repetition frequency (PRF), pressure and power ramp time.

11/2017-present Computational investigation on high pressure plasma enhanced atomic layer deposition (PEALD) CCP sustained in Ar/O_2 feedstock gas.

- Investigated the electron and ion densities, ion fluxes, radiation trapping and ion energy and angular distribution (IEAD) on the wafer using reactor scale model.
- Investigated the influence of the aspect ratio (AR) on the fluxes at feature bottom using feature scale model.
- Investigated the power, pressure, gas mixture's effect on plasma properties including fluxes to the feature bottom.

04/2018-05/2018 Optimized match box simulation using analytical solution to maximize power efficiency.

07/2016-07/2017 Optimized electron Monte Carlo simulation module in HPEM using application programming interface OpenMP for calculation speedup.

08/2015-11/2016 Computational investigation of plasma array consisting of micrometer-scale plasma cells for electromagnetic (EM) wave controlling.

- Investigated a single cell of micrometer-scale pulse-driven capacitively coupled microplasma behavior operating in 10s Torr pressure.
- Investigated the cross-talk between plasma cells within a microplasma array.
- Investigated plasma array and EM wave interaction using ANSYS Electromagnetics package (HFSS).

Conference Presentations

1. **C. Qu**, P. Tian, S. J. Lanham, T. Ma, T. List, P. Arora, V. M Donnelly and M. J. Kushner, Ignition time and transport properties of inductively coupled plasmas using low-high pulsed power, *Gordon Research Conference*, Aug. 2018 [poster]
2. **C. Qu**, P. Agarwal, Y. Sakiyama and M. J. Kushner, Plasma properties of high pressure ALD, *AVS 18th International Conference on Atomic Layer Deposition*, July 2018
3. **C. Qu**, P. Tian, S. J. Lanham, T. Ma, T. List, P. Arora, V. M Donnelly and M. J. Kushner, Ignition time and transport properties of inductively coupled plasmas using low-high pulsed power, *45th International Conference on Plasma Science*, June 2018
4. **C. Qu**, P. Tian, S. J. Lanham, T. Ma, T. List, P. Arora, V. M. Donnelly and M. J. Kushner, Ignition time and transport properties of inductively coupled plasmas using low-high pulsed power, *DOE Center on Control of Plasma Kinetics Annual Meeting*, May 2018 [poster]
5. **C. Qu**, P. Tian, S. Huang and M. J. Kushner, Customizing capacitively coupled plasma properties with triple-frequency power sources, *70th Gaseous Electronics Conference*, Nov. 2017

6. **C. Qu**, P. Tian and M. J. Kushner, Arrays of microplasmas for controlling properties of electromagnetic waves, *63rd International Symposium of the American Vacuum Society*, Nov. 2016 [poster]
7. **C. Qu**, P. Tian and M. J. Kushner, Customizing arrays of microplasmas for controlling properties of electromagnetic waves, *Gordon Research Conference*, July 2016 [poster]
8. **C. Qu**, P. Tian and M. J. Kushner, Customizing arrays of microplasmas for controlling properties of electromagnetic waves, *43rd International Conference on Plasma Science*, June 2016
9. **C. Qu**, P. Tian and M. J. Kushner, Customizing arrays of microplasmas for controlling properties of electromagnetic waves, *DOE Center on Control of Plasma Kinetics Annual Meeting*, May 2016 [poster]
10. P. Tian, **C. Qu** and M. J. Kushner, Properties of DC-pulsed microplasma arrays at intermediate pressures, *68th Gaseous Electronics Conference*, Oct. 2015
11. **C. Qu**, P. Tian and M. J. Kushner, Properties of unipolar DC-pulsed microplasma arrays at intermediate pressures, *68th Gaseous Electronics Conference*, Oct. 2015 [poster]
12. P. Tian, **C. Qu** and M. J. Kushner, Properties of bipolar and unipolar DC-pulsed microplasma arrays at intermediate pressures, *8th International Workshop on Microplasmas*, May 2015