

# Douglass Schumacher

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## Mail and Work Address

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## Current Position

Professor of Physics at The Ohio State University

## Education

University of Michigan, Ann Arbor, MI, Ph.D. Physics 1995.  
University of Illinois, Champaign-Urbana, IL, B.S. Physics 1983.

## Employment

6/16-present Professor, Department of Physics of The Ohio State University  
9/02-5/16 Associate Professor, Department of Physics of The Ohio State University.  
9/96-8/02 Assistant Professor, Department of Physics of The Ohio State University.  
11/94-8/96 Postdoctoral Fellow with Professor T.F. Gallagher, University of Virginia.  
9/90-10/94 Graduate student of Professor P.H. Bucksbaum, University of Michigan.  
9/89-8/90 Member of Technical Staff-1, Physics Research Division, AT&T Bell Laboratories, Murray Hill, NJ.  
7/83-8/89 Senior Technical Associate, Physics Research Division, AT&T Bell Laboratories, Murray Hill, NJ.

## Honors and Societies

Distinguished Teacher Award, OSU, 2013.  
Research Partnership Program Fellowship (Horace Rackham School of Graduate Studies, University of Michigan), 1991-2.  
American Physical Society, Optical Society of America

## Patents

15/313,315 "Liquid Thin-Film Laser Target". Patrick Poole, Claude David Andereck and Douglass Schumacher. Filing Date: 11/11/2016  
PCT/US2015/032268 "Liquid Thin-Film Laser Target". Patrick Poole, Claude David Andereck and Douglass Schumacher. Filing Date: 5/22/2015  
62/082,911, "Liquid Thin-Film Laser Target," Patrick Poole, Claude David Andereck and Douglass Schumacher. (Pending, November 21, 2014)  
62/001,698, "High-repetition rate, liquid crystal thin-film laser target inserter," Patrick Poole, Claude David Andereck and Douglass Schumacher. (Pending, May 22, 2014)

## Papers in refereed journals, edited book chapters

For metrics, see my Web of Science (<http://www.researcherid.com/rid/J-3454-2015>) and Google Scholar (Douglass Schumacher) profiles.

1. "Targets for high repetition rate laser facilities: needs, challenges and perspectives," I. Prencipe, *et al.*, *accepted for publication in High Power Laser Science and Engineering* (2017).
2. "Liquid Crystal Targets and Plasma Mirrors For Laser Based Ion Acceleration," D.W. Schumacher, P.L. Poole, C. Willis, G.E. Cochran, R. Daskalova, J. Purcell and R. Heery, *Journal of Instrumentation* **12**, 1748 (2017). DOI:10.1088/1748-0221/12/04/C04023.
3. "Moderate repetition rate ultra-intense laser targets and optics using variable thickness liquid crystal films," P. L. Poole, C. Willis, G. E. Cochran, R. T. Hanna, C. D. Andereck, and D. W. Schumacher, *Applied Physics Letters* **109**, 151109 (2016). DOI: 10.1063/1.4964841.
4. "Experiment and simulation of novel liquid crystal plasma mirrors for high contrast, intense laser pulses," P. L. Poole, A. Krygier, G. E. Cochran, P. S. Foster, G. G. Scott, L. A. Wilson, J. Bailey, N. Bourgeois, C. Hernandez-Gomez, D. Neely, P. P. Rajeev, R. R. Freeman, and D. W. Schumacher, *Scientific Reports* **6**, 32041 (2016). DOI:10.1038/srep32041.
5. "Experimental capabilities of 0.4 petawatt, 1 shot/min Scarlet laser facility for high energy density science," P. L. Poole, C. Willis, R. L. Daskalova, K. M. George, S. Feister, S. Jiang, J. Snyder, J. Marketon, D. W. Schumacher, K. U. Akli, L. Van Woerkom, R. R. Freeman, And E. A. Chowdhury, *Applied Optics* **55**, 4713 (2016).
6. "Micro-engineering laser plasma interactions at relativistic intensities," S. Jiang, L. L. Ji, H. Audesirk, K. M. George, J. Snyder, A. Krygier, P. Poole, C. Willis, R. Daskalova, E. Chowdhury, N. S. Lewis, D. W. Schumacher, A. Pukhov, R. R. Freeman, and K. U. Akli, *Physical Review Letters* **116**, 085002 (2016). DOI: 10.1103/PhysRevLett.116.085002.
7. "A Confocal Microscope Position Sensor for Micron-Scale Target Alignment in Ultra-Intense Laser-Matter Experiments," Christopher Willis, Patrick L. Poole, Kramer U. Akli, Douglass W. Schumacher, and Richard R. Freeman, *Review of Scientific Instruments* **86**, 053303 (2015). DOI: 10.1063/1.4921554
8. "Modeling crater formation in femtosecond-pulse laser damage from basic principles," Robert A. Mitchell, Douglass W. Schumacher, and Enam A. Chowdhury, *Optics Letters* **40**, 2189 (2015).
9. "Temporal resolution criterion for correctly simulating relativistic electron motion in a high-intensity laser field," Alexey V. Arefiev, Ginevra E. Cochran, Douglass W. Schumacher, Alexander P. L. Robinson and Guangye Chen, *Physics of Plasmas* **22**, 013103 (2015). DOI: 10.1063/1.4905523.
10. "On specular reflectivity measurements in high and low-contrast relativistic laser-plasma interactions," G. E. Kemp, A. Link, Y. Ping, H. S. McLean, P. K. Patel, R. Fedosejevs, Y. Y. Tsui, H. F. Tiedje, D. W. Schumacher, R. R. Freeman, and R. Ramis *Physics of Plasmas* **22**, 013110 (2015); DOI: 10.1063/1.4906053.
11. "Enhancing Bremsstrahlung Production From Ultraintense Laser-Solid Interactions With Front Surface Structures," S. Jiang, A.G. Krygier, D.W. Schumacher, K.U. Akli, R.R. Freeman, *European Physics Journal D* **68**, 283 (2014).
12. "Modeling femtosecond-pulse laser damage using Particle-In-Cell simulations," R. A. Mitchell, D. W. Schumacher, E. A. Chowdhury, *Optical Engineering* **53**, 122507 (2014). DOI:10.1117/1.OE.53.12.122507.
13. "Liquid crystal films as on-demand, variable thickness (50–5000 nm) targets for intense lasers," P. L. Poole, C. D. Andereck, D. W. Schumacher, R. L. Daskalova, S. Feister, K. M. George, C.

- Willis, K. U. Akli and E. A. Chowdhury, *Physics of Plasmas* **21**, 063109 (2014). DOI: 10.1063/1.4885100.
14. "On the origin of super-hot electrons from intense laser interactions with solid targets having moderate scale length preformed plasmas," A. G. Krygier, D. W. Schumacher, and R. R. Freeman, *Physics of Plasmas* **21**, 023112 (2014). DOI: 10.1063/1.4866587.
  15. "Effects of front-surface target structures on properties of relativistic laser-plasma electrons," S. Jiang, A. G. Krygier, D. W. Schumacher, K. U. Akli, and R. R. Freeman, *Physical Review E* **89**, 013106 (2014). DOI: 10.1103/PhysRevE.89.013106.
  16. "Coupling of laser energy into hot-electrons in high-contrast relativistic laser-plasma interactions," G.E. Kemp, A. Link, Y. Ping, D.W. Schumacher, R.R. Freeman, and Pravesh Patel, *Physics of Plasmas* **20**, 033104 (2013).
  17. "The effects of preplasma scale length and laser intensity on the divergence of laser-generated hot electrons," V.M. Ovchinnikov, D.W. Schumacher, M. McMahon, E.A. Chowdhury, C.D. Chen, A. Morace and R.R. Freeman, *Physical Review Letters* **110**, 065007 (2013).
  18. "Coupling of high-intensity laser light to fast electrons in cone-guided fast ignition," K.U. Akli, C. Orban, D. Schumacher, M. Storm, M. Fatenejad, D. Lamb and R.R. Freeman, *Physics Review E (Rapid Communications)* **86**, 065402(R) (2012).
  19. "Time dependence of fast electron beam divergence in ultraintense laser-plasma interactions," K. U. Akli, M. J. Storm, M. McMahon, S. Jiang, V. Ovchinnikov, D. W. Schumacher, R. R. Freeman, G. Dyer, and T. Ditmire, *Physics Review E* **86**, 026404 (2012).
  20. "Using time-integrated  $K_{\alpha}$  images to study refluxing and the extent of pre-plasmas in LPI experiments," V. M. Ovchinnikov, D.W. Schumacher, G.E. Kemp, A.G. Krygier, L.D. Van Woerkom, K.U. Akli, R.R. Freeman, R.B. Stephens, A. Link, *Physics of Plasmas* **18**, 112702 (2011).
  21. "How well do time-integrated  $K_{\alpha}$  images represent hot electron spatial distributions?," V. M. Ovchinnikov, G. E. Kemp, D. W. Schumacher, R. R. Freeman, and L. D. Van Woerkom, *Physics Of Plasmas* **18**, 072704 (2011).
  22. "Effects of target charging and ion emission on the energy spectrum of emitted electrons," Anthony Link, Richard R. Freeman, Douglass Schumacher and Linn Van Woerkom, *Physics of Plasmas* **18**, 053107 (2011).
  23. "The shaped critical surface in high intensity laser plasma interactions," D. W. Schumacher, G. E. Kemp, A. Link, R. R. Freeman, and L. D. Van Woerkom, *Physics of Plasmas* **18**, 013102 (2011).
  24. "Energy Injection for Fast Ignition", Richard B. Stephens, Kramer U. Akli, Teresa Bartal, Farhat N. Beg, Sugreev Chawla, Cliff D. Chen, Hui Chen, Sophia Chen, Bradley Chrisman, Richard R. Freeman, Daniel Hey, Michael Key, Andreas Kemp, James King, Katherine Lancaster, Sebastien Lepape, Anthony Link, Tammy Ma, Andy Mackinnon, Andrew Macphee, Peter Norreys, Dustin Offerman, Vladimir Ovchinnikov, John Pasley, Prav Patel, Douglas Schumacher, Yasuhiko Sentoku, Ying Tsui, Scott Wilks, Linn Van Woerkom, Ming-Sheng Wei And Toshinori Yabuuchi, *Plasma and Fusion Research (Review Articles)* **4**, 016 (2009).
  25. "Fast electron generation in cones with ultraintense laser pulses," L. Van Woerkom, K. U. Akli, T. Bartal, F. N. Beg, S. Chawla, C. D. Chen, E. Chowdhury, R. R. Freeman, D. Hey, M. H. Key, J. A. King, A. Link, T. Ma, A. J. MacKinnon, A. G. MacPhee, D.

- Offermann, V. Ovchinnikov, P. K. Patel, D. W. Schumacher, R. B. Stephens, and Y. Y. Tsui, *Physics of Plasmas* **15**, 056304 (2008).
26. "KHz Dye Laser For Use With Ultrafast Laser Systems," Douglass Schumacher, Owen Marshall, Joshua Holt, Michael L. Bajema, Robert van Leeuwen, Thomas F. Gallagher, *Applied Optics LP* **41**, 1722 (2002).
  27. "A novel study of supercontinuum generation," Jennifer Tate and Douglass Schumacher, *Applied Physics B* **74**, S57 (2002).
  28. "Controlling Continuum Generation," Douglass Schumacher, *Optics Letters* **27**, 451 (2002).
  29. "Highly Perturbed States Of Barium In A Static Electric Field," Kenneth A. Bates, Jumpei Masae, Camelia Vaselescu, Douglass Schumacher, *Physical Review A* **64**, 033409 (2001).
  30. "Interferometric Pump-Probe Study Of Intense Field Excitation Of Sapphire," Jennifer Tate, Douglass Schumacher, *Physical Review Letters* **87**, 053901 (2001).
  31. "Temporal dynamics of a two-electron wavepacket," B.J. Lyons, D.W. Schumacher, D.I. Duncan, R.R. Jones, and T.F. Gallagher, *Physical Review A* **57**, 3712 (1998).
  32. "Wave Packets in Perturbed Rydberg Systems," D.W. Schumacher, B.J. Lyons, and T.F. Gallagher, *Physical Review Letters* **78**, 4359 (1997).
  33. "Time Resolved Configuration Interaction," D.W. Schumacher, D.I. Duncan, R.R. Jones, and T.F. Gallagher, *Journal of Physics B* **29**, L397 (1996).
  34. "Phase dependence of intense-field ionization," D. W. Schumacher and P. H. Bucksbaum, *Physical Review A* **54**, 3284(1996).
  35. "Programmable Cesium Rydberg Wavepackets," D. W. Schumacher, J. H. Hoogenraad, Dan Pinkos, P. H. Bucksbaum, *Physical Review A* **52**, 4719 (1995).
  36. "Bound-State Interferometry Using Incoherent Light," R.R. Jones, D.W. Schumacher, T.F. Gallagher, and P.H. Bucksbaum, *Journal of Physics B: Atomic, Molecular, And Optical Physics* **28**, L405 (1995).
  37. "Phase Dependence of Intense-Field Ionization: A Study Using Two Colors," D. W. Schumacher, F. Weihe, H. G. Muller, and P. H. Bucksbaum, *Physical Review Letters* **73**, 1344 (1994).
  38. "Production of Programmable Amplified, Shaped Pulses in Femtosecond Lasers," D. Pinkos, J. Squier, D. Schumacher, P. Bucksbaum, B. Kohler, V.V. Yokovlev, and K.R. Wilson, *Ultrafast Phenomena IX*, ed. by P.F. Barbara, W.H. Knox, G.A. Mourou, and A.H. Zewail, Berlin: Springer Series in Chemical Physics **60**, 180 (1994).
  39. "Programmable Wavefunction Engineering in Cs Rydberg States," P. H. Bucksbaum, D. W. Schumacher, J. H. Hoogenraad, Jeffrey L. Krause, Kent R. Wilson, *Ultrafast Phenomena IX*, ed. by P.F. Barbara, W.H. Knox, G.A. Mourou, and A.H. Zewail, Berlin: Springer Series in Chemical Physics **60**, 240 (1994).
  40. "Population Trapping in Kr and Xe in Intense Laser Fields," R.R. Jones, D.W. Schumacher, and P.H. Bucksbaum, *Physical Review A* **47**, R49 (1993).

41. "Ramsey interference in strongly driven Rydberg Systems," R. R. Jones, C. S. Raman, D. W. Schumacher, and P. H. Bucksbaum, *Physical Review Letters* **71**, 2575 (1993).
42. "Longer wavelengths require lower intensity in multiphoton detachment of negative ions," M.D. Davidson, D.W. Schumacher, P.H. Bucksbaum, H.G. Muller, and H.B. van Linden van den Heuvell, *Physical Review Letters* **69**, 3459 (1992).
43. "Phase-Dependent Ionization Using an Intense Two-Color Light Field," D. Schumacher, M.P. deBoer, H.G. Muller, R.R. Jones, and P.H. Bucksbaum, in *Ultrafast Phenomena VIII*, ed. by J.-L. Martin, A. Migus, G.A. Mourou, and A.H. Zewail, Berlin: Springer Verlag Series in Chemical Physics **55**, 257 (1992).
44. "Generation of High-Power Single-Cycle Picosecond Radiation," D.R. Dykaar, R.R. Jones, D. You, D. Schumacher, and P.H. Bucksbaum, in *Ultrafast Phenomena VIII*, ed. by J.-L. Martin, A. Migus, G.A. Mourou, and A.H. Zewail, Berlin: Springer Verlag Series in Chemical Physics **55**, 490 (1992).
45. "Softening of the H<sub>2</sub><sup>+</sup> Molecular Bond in Intense Laser Fields," P.H. Bucksbaum, A. Zavriyev, H.G. Muller, D.W. Schumacher *Physical Review Letters* **64**, 1883 (1990).
46. "Ionization and Dissociation of H<sub>2</sub> in Intense Laser Fields at 1064 nm, 532 nm, and 355 nm," A. Zavriyev, P.H. Bucksbaum, H.G. Muller, and D.W. Schumacher, *Physical Review A* **42**, 5500 (1990).
47. "Nonresonant Above-Threshold Ionization with Circularly Polarized Sub-picosecond Pulses," P.H. Bucksbaum, L.D. VanWoerkom, R.R. Freeman, D.W. Schumacher, *Physical Review A* **41**, 4119 (1990).
48. "Above-threshold ionization with a 2-color radiation field," H.G. Muller, P.H. Bucksbaum, D.W. Schumacher, and A. Zavriyev, *Journal of Physics B*. **23**, 2761 (1990).
49. "Bond Softening and Above Threshold Dissociation in H<sub>2</sub><sup>+</sup>" P.H. Bucksbaum, A. Zavriyev, H.G. Muller, and D.W. Schumacher, in *Multiphoton Processes*, ed. by G. Mainfray and P. Agostini, CEA, Paris, p. 181 (1990).
50. "Asymmetries in Above-Threshold Ionization," M. Bashkansky, P.H. Bucksbaum, and D.W. Schumacher, *Physical Review Letters* **60**, 2458 (1988).
51. "High Intensity Kapitza-Dirac Effect," P.H. Bucksbaum, D.W. Schumacher, and M. Bashkansky, *Physical Review Letters* **61**, 1182 (1988).
52. "Above-Threshold Ionization in Helium," P.H. Bucksbaum, M.Bashkansky, and D.W. Schumacher, *Physical Review A* **37**, 3615 (1988).
53. "Above-Threshold Ionization with Elliptically Polarized Light", M. Bashkansky, P. H. Bucksbaum, and D. W. Schumacher, *Physical Review Letters* **59**, 274 (1987).
54. "Above-Threshold Ionization with Subpicosecond Laser Pulses", R. R. Freeman, P. H. Bucksbaum, H. Milchberg, S. Darack, D. Schumacher, and M. Geusic, *Physical Review Letters* **59**, 1092 (1987).

## Conference proceedings and bulletins

1. "Proton Energy Optimization and Spatial Distribution Analysis from a Thickness Study Using Liquid Crystal Targets," C. Willis, P. L. Poole, D. W. Schumacher, R. R. Freeman, L. Van Woerkom, DPP 2016, Bulletin of the American Physical Society **61** (2016).
2. "Progress toward a practical laser driven ion source using variable thickness liquid crystal targets," P. L. Poole, G. E. Cochran, K. Zeil, J. Metzkes, L. Obst, T. Kluge, H. P. Schlenvoigt, I. Prencipe, T. Cowan, U. Schramm, D. W. Schumacher, DPP 2016, Bulletin of the American Physical Society **61** (2016).
3. "Front surface structured targets for enhancing laser-plasma interactions," Joseph Snyder, Kevin George, Liangliang Ji, Sasir Yalamanchili, Ethan Simonoff, Ginevra Cochran, Rebecca Daskalova, Patrick Poole, Christopher Willis, Nathan Lewis, Douglass Schumacher DPP 2016, Bulletin of the American Physical Society **61** (2016).
4. "Enhancing Target Normal Sheath Accelerated Ions with Micro-structured Targets," Kevin George, Joseph Snyder, Liangliang Ji, Trevor Rubin, Abraham Handler, Patrick Poole, Christopher Willis, Rebecca Daskalova, Ginevra Cochran, Douglass Schumacher, DPP 2016, Bulletin of the American Physical Society **61** (2016).
5. "Experiments and PIC simulations on liquid crystal plasma mirrors for pulse contrast enhancement," G. E. Cochran, P. L. Poole, A. Krygier, P.S. Foster, G. G. Scott, L. A. Wilson, J. Bailey, N. Bourgeois, C. Hernandez-Gomez, R. Heery, J. Purcell, D. Neely, P. P. Rajeev, R. R. Freeman, D. W. Schumacher, DPP 2016, Bulletin of the American Physical Society **61** (2016).
6. "Liquid crystal film development for plasma mirrors and waveplates," G.E. Cochran, P.L. Poole, C. Willis, R.J. Hanna, K. Pytel, K.S. Sullivan, C.D. Andereck, D.W. Schumacher, DPP 2015, Bulletin of the American Physical Society **60** (2015).
7. "Optimized ion acceleration using high repetition rate, variable thickness liquid crystal targets," P.L. Poole, C. Willis, G.E. Cochran, C.D. Andereck, D.W. Schumacher, DPP 2015, Bulletin of the American Physical Society **60** (2015).
8. "Single-shot femtosecond laser ablation of copper: experiment vs. simulation," Enam Chowdhury, Kyle R. P. Kafka, Robert Mitchell, Alex M. Russell, Kevin Werner, Noah Talisa, Hui Li, Allen Yi, Douglass Schumacher, *Laser-Induced Damage in Optical Materials: 2015*, Proceedings SPIE **9632**, 96320R (2015).
9. "Simulations of High Intensity Short Pulse Lasers Incident on Reduced Mass Targets Using LSP," Frank W. King, Chris Orban, Kramer U. Akli and Douglass Schumacher, DPP 2014, Bulletin of the American Physical Society **59** (2014).
10. "Liquid crystals as on-demand, variable thickness targets for intense laser applications," Patrick L. Poole, C. David Andereck and Douglass Schumacher, DPP 2014, Bulletin of the American Physical Society **59** (2014).
11. "Adapting Particle-In-Cell simulations to the study of short pulse laser damage," Robert Mitchell, Douglass Schumacher and Enam Chowdhury, DPP 2014, Bulletin of the American Physical Society **59** (2014).
12. "First PIC simulations modeling the interaction of ultra-intense lasers with sub-micron, liquid crystal targets," Matthew McMahon, Patrick Poole, Christopher Willis, David

- Andereck and Douglass Schumacher, DPP 2014, Bulletin of the American Physical Society **59** (2014).
13. "Intensity-dependent criteria for PIC simulations of relativistic electrons in a laser field," Ginevra E. Cochran, Alexey V. Arefiev, Douglass W. Schumacher, A.P.L. Robinson and Guangye Chen, DPP 2014, Bulletin of the American Physical Society **59** (2014).
  14. "Enhancing Bremsstrahlung Radiation using Front Surface Target Structures," Sheng Jiang, Andrew Krygier, Douglass Schumacher, Richard Freeman and Kramer Akli, DPP 2014, Bulletin of the American Physical Society **59** (2014).
  15. "Using Particle-In-Cell simulations to model femtosecond pulse laser damage," Robert A. Mitchell, Douglass Schumacher, Enam Chowdhury, *Laser-Induced Damage in Optical Materials: 2014*, Proceedings SPIE **9237**, 92370X (2014).
  16. "On The Origin of Super-Hot Electrons from Intense Laser Interactions with Solid Targets having Moderate Scale Length Preformed Plasma," A.G. Krygier, D.W. Schumacher, R.R. Freeman, DPP 2013, Bulletin of the American Physical Society **58** (2013).
  17. "Creating Uniform Temperature Solid Density Plasmas with Intense Femtosecond Lasers," K. George, S. Jiang, S. Wilks, A. Link, D.W. Schumacher, R.R. Freeman, K.U. Akli, DPP 2013, Bulletin of the American Physical Society **58** (2013).
  18. "Shaping the Spectrum of Hot Electrons using Structured Targets," Sheng Jiang, Andrew Krygier, Douglass Schumacher, Richard Freeman, Kramer Akli, DPP 2013, Bulletin of the American Physical Society **58** (2013).
  19. "Modeling target normal sheath acceleration using handoffs between multiple simulations," Matthew McMahon, Christopher Willis, Robert Mitchell, Frank King, Douglass Schumacher, Kramer Akli, Richard Freeman, DPP 2013, Bulletin of the American Physical Society **58** (2013).
  20. "Design of a liquid membrane target for high repetition rate neutron generation," Patrick Poole, C. David Andereck, Mike Storm, Douglass Schumacher, DPP 2013, Bulletin of the American Physical Society **58** (2013).
  21. "Modeling femtosecond pulse laser damage on conductors using Particle-In-Cell simulations," Robert A. Mitchell, Douglass Schumacher, Enam Chowdhury, Proceedings SPIE **8885**, 88851U (2013).
  22. "The effects of pre-plasma scale length and laser intensity on hot electron divergence," V.M. Ovchinnikov, D.W. Schumacher, M. McMahon, R.R. Freeman, DPP 2012, Bulletin of the American Physical Society **57** (2012).
  23. "Entire-target, Particle-In-Cell Modeling of Ultra-Intense Laser Experiments with Cone-Coupled Wire Targets," C. Orban, K. Akli, R. Mitchell, V. Ovchinnikov, D.W. Schumacher, R.R. Freeman, M. Fatenejad, D. Lamb, DPP 2012, Bulletin of the American Physical Society **57** (2012).
  24. "Specular reflectivity in high contrast relativistic laser-plasma interactions," G.E. Kemp, A. Link, R. Fedosejevs, R.R. Freeman, F. Beg, H. Friesen, D.P. Higginson, M.H. Key, H.S. McLean, P. Patel, Y. Ping, D.W. Schumacher, R.B. Stephens, H.F. Tiedje, Y.Y. Tsui, DPP 2012, Bulletin of the American Physical Society **57** (2012).

25. "Particle-In-Cell modeling of Fast Ignition experiments on the Titan Laser," A. Link, K.U. Akli, F. Beg, C.D. Chen, J.R. Davies, R.R. Freeman, G.E. Kemp, K. Li, H.S. McLean, A. Morace, P.K. Patel, D.W. Schumacher, A.V. Sorokovikova, R. Stephens, M.H.V. Streeter, D. Wertepny, B. Westover, DPP 2012, Bulletin of the American Physical Society **57** (2012).
26. "Characterization of MeV Electron Generation Using Second Harmonic Laser Pulses for Fast Ignition Applications," R. Fedosejevs, D.P. Higginson, H. Friesen, A. Sorokovikova, L.C. Jarrott, A. Link, G.E. Kemp, D. Hey, Y. Ping, I. Bush, A. Beaudry, J. Tait, J.N. Westwood, H.F. Tiedje, S. Singh, M.Z. Mo, Y.Y. Tsui, B. Westover, F.N. Beg, K.U. Akli, R.R. Freeman, L.D. Van Woerkom, D. Schumacher, C. Chen, M.H. Key, H.S. McLean, P. Patel, T. Doeppner, R.B. Stephens, J. Pasley, and R Ramis, EPS Plasma Physics Conference (2012).
27. "Characterization of MeV Electron Generation using 527 nm Laser Pulses for Fast Ignition," Robert Fedosejevs, D.P. Higginson, H. Friesen, A. Sorokovikova, C.C. Jarrott, A. Link, G.E. Kemp, D. Hey, Y. Ping, I. Bush, H.F. Tiedje, M.Z. Mo, Y.Y. Tsui, B. Westover, F.N. Beg, K.U. Akli, R.R. Freeman, L.D. Van Woerkom, D. Schumacher, C. Chen, H.S. McLean, P. Patel, T. Doeppner, R.B. Stephens, J. Pasley, J. Westwood, J. Tait, A. Beaudry, S. Singh, and M.H. Key, DPP 2011, Bulletin of the American Physical Society **56** (2011).
28. "Wavelength effects on hot electron generation at relativistic intensities," A. Link, K.U. Akli, F. Beg, I. Bush, C.D. Chen, J.R. Davies, R. Fedosejevs, R.R. Freeman, H. Friesen, D.S. Hey, D.P. Higginson, G.E. Kemp, L.C. Jarrott, K. Li, H.S. McLean, A. Morace, P.K. Patel, D.W. Schumacher, A.V. Sorokovikova, R. Stephens, J.V. Streeter, H.F. Tiedje, Y.Y. Tsui, D. Wertepny, B. Westover, DPP 2011, Bulletin of the American Physical Society **56** (2011).
29. "LSP simulations of the effect of scattering on hot electron transport," A.G. Krygier, S. Jiang, V. Ovchinnikov, D.W. Schumacher, R.R. Freeman, A. Link, DPP 2011, Bulletin of the American Physical Society **56** (2011).
30. "Experimental and LSP modeling study of pre-pulse effects on the laser-plasma interaction by using a 527 nm laser pulse," G.E. Kemp, D.W. Schumacher, A. Link, R.R. Freeman, H. Friesen, H.F. Tiedje, Y.Y. Tsui, R. Fedosejevs, D.P. Higginson, F.N. Beg, M.H. Key, H.S. McLean, P. Patel, R.B. Stephens, DPP 2011, Bulletin of the American Physical Society **56** (2011).
31. "LSP modeling of ultra-intense lasers on cone-coupled wire targets: effect of cone thickness," Chris Orban, Vladimir Ovchinnikov, Kramer Akli, Anthony Link, Douglass Schumacher, Richard Freeman, DPP 2011, Bulletin of the American Physical Society **56** (2011).
32. "LSP Simulations of High Intensity Short Pulse Lasers Incident On Reduced Mass Targets," Frank W. King, Vladimir M. Ovchinnikov, Douglass Schumacher, Kramer U. Akli, Richard R. Freeman, DPP 2011, Bulletin of the American Physical Society **56** (2011).
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