# Jacob Bortnik

## Contact Details:

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## Research Interests:

- The generation, propagation, and detection of electromagnetic waves in space plasmas, particularly in the electron and ion cyclotron modes
- Space weather and its effects on technology, the dynamics of the energetic radiation environment of the earth, effects on satellites, astronauts, space tourism, and power lines,
- Numerical modeling techniques, ray tracing, time domain approaches, dynamical test-particle simulations, full wave codes, and parallel computation
- Space weather and its effects on the energization and decay of the Earth's electron radiation-belts, including sudden dropouts of outer radiation-belt fluxes
- Electromagnetic waves in the ULF – VLF range associated with earthquakes, propagation to LEO satellite altitudes, as well as associated space technology
- I have taken part in various projects including the design of a dual-speed, three-phase induction machine for a conveyor belt, investigating partial electrical breakdown in SF6 gas, design of an automotive fuel consumption meter, and evaluating alternative modes of power transmission in Africa, so I am always open to, and curious about interesting and relevant problems involving physics and engineering.

## Teaching Experience:

- Spring 2006: UCLA E&S Sci. M288C and A&O Sci. M275C joint seminar
- Winter 2003: Taught the Ph.D.-level class EE356, "Introduction to Plasma Physics". Responsibilities included teaching, setting and grading homework sets and exams (Stanford U.)
- Spring 2002: Teaching assistant to Prof. Umran S. Inan for the class EE356, "Introduction to Plasma Physics". Responsibilities included setting and grading homework sets and exams, and holding consultation sessions (Stanford University)
- 1997-1998: Teaching associated with professional assistantship
  - Laboratory supervisor for the second and third year electronics laboratory classes
  - Responsibilities included lab demonstration, supervision of student group experiments, and grading of lab reports
  - Teaching a class in "Engineering design" for first and third year student groups, where practical design problems were tackled to illustrate the methodology and design cycle
  - Taught a number of bridging classes to underprivileged students entering the engineering degree who lacked essential background to proceed to the first year directly (University of the Witwatersrand, South Africa)

## Professional Experience:

- Sept 2006 – present: Assistant Researcher in the Department of Atmospheric and Oceanic Sciences, University of California, Los Angeles.
- Sept 2004 – Sept. 2006: Postdoctoral scholar in the Department of Atmospheric and Oceanic Sciences, University of California, Los Angeles. Working with Prof. Richard M. Thorne on radiation belt dynamics and space plasma waves
- Nov 2008 – present: Solana Scientific, generation/propagation of plasma waves and electron interactions.
- June 2004 – present: Consultant to QuakeFinder on ionospheric/magnetospheric seismogenic wave propagation, statistical data analysis and signal detection.
- July 2004 – Sept 2004: Postdoctoral position in the Very Low Frequency (VLF) group, Department of Electrical Engineering, Stanford University. Duties included completion of journal articles, research and proposal writing
- Sept 1998 – July 2004: Research assistant in the Very Low Frequency (VLF) group, Department of Electrical Engineering, Stanford University. Duties include active research on my thesis topic, support of group research projects, teaching assistant duties, support in proposal writing
- Journal paper reviews: currently an active reviewer for the Journal of Geophysical Research (Space Physics), Geophysical Research Letters, Earth, Planets and Space, and Annales Geophysicae.
- Reviewed proposals for the National Science Foundation (NSF), and National Aeronautics and Space Administration (NASA), and Los Alamos National Laboratories (LANL).
- Current member of the American Geophysical Union (AGU), and International Union of Radio Science (URSI).
- Session organizer and convener at numerous meetings.
- Acted as a judge in the Intel international science and engineering fair 2001, in San Jose, CA.
- 1997-1998: Professional assistant in the Department of Electrical Engineering (High Voltage Group), University of the Witwatersrand, Johannesburg, South Africa. Responsibilities included teaching a number of classes (see above), research, and consulting to external companies. One such project was the design of fast-response lightning/surge protection unit for 100 base-T Ethernet connectors.
- 1995-1996 Summer: Engineering intern at Lethabo power Station, ESKOM (the South African Energy Supply COMany). Responsibilities included the performance of investigative and maintenance duties under a supervisor.

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## Education:

Sept. 1998 – June 2004: Stanford University, Palo Alto, California, USA
Doctor of Philosophy (Ph.D.) degree in the Department of Electrical Engineering. Specialization in lightning-generated, Very Low Frequency (VLF) wave propagation. Magnetospherically Reflected (MR) whistler mode wave-particle interactions and precipitation, Prof. Umran S. Inan

Feb 1993 – Sept. 1998: University of the Witwatersrand, Johannesburg, South Africa
- Bachelor of Science (B.Sc. CUM LAUDE) degree in the Department of Electrical Engineering
- Master of Science (M.Sc.) degree [by research], obtained with Honors, Dept. of Electrical Engineering, Dissertation title: Transmission Line Compaction using High Phase Order Transmission

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## Relevant skills and abilities:

- Computer programming: mathematical /scientific programming and parallel computing. Languages include: Matlab, C, C++, UNIX shell scripting, and FORTRAN.
- Public speaking and presentation: MS Powerpoint-based, and poster presentations
- Professional writing: have written several journal articles as well as wrote/co-wrote several research proposals (NASA and NSF)
- Leadership: Vice President of UCLA Society of Postdoctoral Scholars, chair of social committee; VLF group Ultimate-Frisbee intramurals captain (2000 – Championship winner; 2001); Squash league captain (South Africa: 1997; 1998)
- Spoken languages: English, Afrikaans, Russian, Hebrew

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## Awards (partial):

- 2008: Work directly listed in Discover Magazine's Top 100 stories of 2008, #93: Physicists discover the source of Earth's "Mystery Hiss", Dec. 2008
- 2008: Jacob Bortnik listed in Marquis' Who's Who in America (2009), for the discovery of the origin of plasmaspheric hiss (announcement 2008)
- 2006: National Science Foundation, Geospace Environment Modeling (GEM) Postdoctoral scholar award.
- 2005: Young Scientist Award for XXVIIIth URSI general assembly, New Delhi, India 2005
- 2004: Outstanding student paper award for presentation SM42A-0622, presented at the AGU 2003 Fall meeting in San Francisco
- 2003: Outstanding student paper award for presentation SM52A-0558, presented at the AGU 2002 Fall meeting in San Francisco
- 1996: Chamber of Mines gold medal and research scholarship – all to the best graduand for B.Sc (Eng) – all branches
- 1996: Bernard Price Prize (Electrical) – Best final year student in electrical engineering
- 1996: Altech electronic engineering medal – Best graduand (with distinction) in Electrical Engineering subjects

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## Refereed publications:

1. Bortnik, J., W. Li, R. M. Thorne, V. Angelopoulos, C. Cully, J. Bonnell, O. Le Contel, and A. Roux, An Observation Linking the Origin of Plasmaspheric Hiss to Discrete Chorus Emissions, *Science*, Vol. 324, Iss. 5928, p. 775, doi:10.1126/science.1171273, 2009.
2. Li, W., R. M. Thorne, V. Angelopoulos, J. Bortnik, C. M. Cully, B. Ni, O. LeContel, A. Roux, U. Auster, and W. Magnes, Global distribution of whistler-mode chorus waves observed on the THEMIS spacecraft, *Geophys. Res. Lett.,* Vol. 36, Iss. 9, CiteID L09104, doi:10.1029/2009GL037595, 2009.
3. Bortnik, J, R. M. Thorne, and U. S. Inan, Nonlinear interaction of energetic electrons with large amplitude chorus, *Geophys. Res. Lett.*, Vol. 35, Iss. 21, CiteID L21102, doi:10.1029/2008GL035500, 2008.
4. Li, W., R. M. Thorne, N. P. Meredith, R. B. Horne, J. Bortnik, Y. Y. Shprits, and B. Ni, Evaluation of whistler mode chorus amplification during an injection event observed on CRRES, *J. Geophys. Res.*, Vol. 113, Iss. A9, CiteID A09210, doi:10.1029/2008JA013129, 2008.
5. Bortnik, J., J. W. Cutler, C. Dunson, and T. E. Bleier, The possible statistical relation of Pc1 pulsations to Earthquake occurrence at low latitudes, *Annales Geophysicae*, Vol. 26, Iss. 9, pp. 2825-2836, 2008.

6. Nemec, F., O. Santolik, M. Parrot, and J. Bortnik, Power line harmonic radiation observed by satellite: Properties and propagation through the ionosphere, *J. Geophys. Res.*, Vol. 113, Iss. A8, CiteID A08317, doi:10.1029/2008JA013184, 2008.
7. Kulkarni, P., U. S. Inan, T. F. Bell, and J. Bortnik, Precipitation signatures of ground-based VLF transmitters, *J. Geophys. Res.*, doi:10.1029/2007JA012569, 2008.
8. Ni, B., R. M. Thorne, Y. Y. Shprits, and J. Bortnik, Resonant scattering of plasma sheet electrons by whistler-mode chorus: Contribution to diffuse auroral precipitation, *Geophys. Res. Lett.*, Vol. 35, Iss. 11, CiteID L11106, doi:10.1029/2008GL034032, 2008.
9. Cutler, J., J. Bortnik, C. Dunson, J. Doering, and T. Bleier, CalMagNet – an array of search coil magnetometers monitoring ultra low frequency activity in California, *Natural Hazards and Earth System Science*, Vol. 8, Iss. 2, pp. 359-368, 2008.
10. Bortnik, J., R. M. Thorne, and N. P. Meredith, The unexpected origin of plasmaspheric hiss from discrete chorus emissions, *Nature*, Vol. 452, Iss. 7183, pp. 62-66, 2008.
11. Bortnik, J., J. W. Cutler, C. Dunson, T. E. Bleier, and R. L. McPherron, Characteristics of low latitude Pc1 pulsations during geomagnetic storms, *J. Geophys. Res.*, Vol. 113, A04201, doi:10.1029/2007JA012867, 2008.
12. Engebretson, M. J., M. R. Lessard, A. T. Weatherwax, D. L. Detrick, J. C. Green, J. Bortnik, J. L. Posch, N. J. Petit, M. C. Rose, and R. B. Horne, Pc1-Pc2 waves and energetic particle precipitation during and after magnetic storms: superposed epoch analysis and case studies, *J. Geophys. Res.*, Vol. 113, Iss. A1, CiteID A01211, 10.1029/2007JA012362, 2008.
13. Bortnik, J., R. M. Thorne, and N. P. Meredith, Modeling the propagation characteristics of chorus using CRRES suprathermal electron fluxes, *J. Geophys. Res.*, Vol. 112, Iss. A8, CiteID: A08204, doi:10.1029/2006JA012237, 2007.
14. Bortnik, J., R. M. Thorne, N. P. Meredth, and O. Santolik, Ray tracing of penetrating chorus and its implications for the radiation belts, *Geophys. Res. Lett.*, Vol. 34, Iss. 15, CiteID L15109, doi:10.1029/2007GL030040, 2007.
15. Rodger, C. J., M. A. Clilverd, D. Nunn, P. T. Verronen, J. Bortnik, and E. Turunen, Storm time, short-lived bursts of relativistic electron precipitation detected by subionospheric radio wave propagation, *J. Geophys. Res.*, 112, A07301, doi:10.1029/2007JA012347, 2007.
16. Bortnik J, J. W. Cutler, C. Dunson, and T. E. Bleier, An automatic wave detection algorithm applied to Pc1 pulsations, *J. Geophys. Res.* Vol. 112, A04204, doi:10.1029/2006JA011900, 2007.
17. Bortnik J., R. M. Thorne, T. P. O'Brien, J. C. Green, R. J. Strangeway, Y. Y. Shprits, and D. N. Baker, Observation of two distinct, rapid loss-mechanisms during the 20 November 2003 radiation belt dropout event, *J. Geophys. Res.*, Vol. 111, A12216, doi:10.1029/2006JA011802, 2006.
18. Bortnik J. and R. M. Thorne, The dual role of ELF/VLF chorus waves in the acceleration and precipitation of radiation belt electrons, *J. Atmos. & Sol. Terr. Phys., Special Issue: Global Aspects of Magnetosphere-Ionosphere Coupling*, 2006 [Accepted – in print].
19. Thorne, R. M., R. B. Horne, V. K. Jordanova, J. Bortnik, and S. Glauert, Interaction of EMIC waves with thermal plasma and radiation belt particles, in *Magnetospheric ULF Waves, Geophys. Monogr. Series*, edited by K. Takahashi, B. Lysak, and P. Chi, AGU, Washington, D. C., 2006.
20. Bortnik J., U. S. Inan, and T. F. Bell, Landau damping and resultant unidirectional propagation of chorus waves, *Geophys. Res. Lett.*, Vol. 33, L03102, doi:10.1029/2005GL024553, 2006.
21. Bortnik J., U. S. Inan, and T. F. Bell, Temporal signatures of radiation belt electron precipitation induced by lightning generated MR whistler waves. Part I: Methodology, *J. Geophys. Res.*, Vol. 111, A02204, doi:10.1029/2005JA011182, 2006.
22. Bortnik J., U. S. Inan, and T. F. Bell, Temporal signatures of radiation belt electron precipitation induced by lightning generated MR whistler waves. Part II: Global signatures, *J. Geophys. Res.*, Vol. 111, A02205, doi:10.1029/2005JA011398, 2006.
23. Bortnik J., U. S. Inan, and T. F. Bell, Frequency-time spectra of magnetospherically reflecting whistlers in the plasmasphere, *J. Geophys. Res.*, 108(A1), 10.1029/2002JA009387, Jan 2003

24. Bortnik J., U. S. Inan, and T. F. Bell, Energy distribution and lifetime of magnetospherically reflecting whistlers in the plasmasphere, *J. Geophys. Res.*, Vol. 108, No. A5, 10.1029/2002JA009316, May 2003
25. Inan U. S., T. F. Bell, J. Bortnik, Controlled precipitation of radiation belt electrons, *J. Geophys. Res.*, Vol. 108, No. A5, 10.1029/2002JA009580, May 2003
26. Bell T. F., U. S. Inan, J. Bortnik, and J. D. Scudder, The Landau damping of magnetospherically reflected whistlers within the plasmasphere, *Geophys. Res. Lett.,* Vol. 29, No. 15, Aug. 2002
27. Bortnik J., U. S. Inan, and T. F. Bell, *L*-dependence of energetic electron precipitation driven by magnetospherically reflecting whistler waves, *J. Geophys. Res.*, Vol. 107, No. A8, Aug. 2002
28. Blake J. B., U. S. Inan, M. Walt, T. F. Bell, J. Bortnik, D. L. Chenette, and H. J. Christian, Lightning-induced energetic electron flux enhancements in the drift loss cone, *J. Geophys. Res.,* Vol. 106, No. A12, pp. 29,733-29-744, Dec. 2001
29. Lorentzen K. R., J. B. Blake, U. S. Inan, and J Bortnik, Observations of relativistic electron micro-bursts in association with VLF chorus, *J. Geophys. Res*., Vol. 106, No. A4, p. 6017, Apr. 2001
30. Bortnik J, Compaction technology: could high phase order transmission ever get right of way?, Electricity+Control, July 1998, pp 23-24.
31. Bortnik J., and J. P. Reynders, Compaction technology: high phase order transmission in the South African context, SAUPEC 98, Proceedings of the Seventh Southern African Universities power engineering conference, pp. 131-134, University of Stellenbosch, 1998

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## Presentations:

1. Bortnik, J., First observation linking the origin of plasmaspheric hiss to discrete chorus emissions, UC Berkeley, Space Sciences Lab Invited Seminar, March 2009.
2. Bortnik, J., The evolution of discrete chorus elements into plasmaspheric hiss, La Jolla, CA., Feb. 2009.
3. Li, W., R. M. Thorne, J. Bortnik, and V. Angelopoulos, Statistical analysis of the global distribution of electrons for the chorus generation observed on the THEMIS spacecraft, American Geophysical Union, Fall meeting 2008, abstract #SM21A-1660 [INVITED].
4. Bortnik, J., R. M. Thorne and U. S. Inan, The nonlinear interaction of radiation-belt electrons with large amplitude chorus, American Geophysical Union, Fall Meeting 2008, #SM43B-06.
5. Bortnik, J., R. M. Thorne, and U. S. Inan, Nonlinear interaction of electrons with large amplitude chorus (give in place of "Modeling VLF trans-ionospheric propagation using the full-wave technique"), XXIX General Assembly of the International Union of Radio Science (URSI), Invited Talk, Chicago, August 2008.
6. Bortnik, J., R. M. Thorne, and N. P. Meredith, The origin of plasmaspheric hiss, XXIX General Assembly of the International Union of Radio Science (URSI), Invited Talk, Chicago, August 2008.
7. Bortnik, J., J. W. Cutler, C. Dunson, and T. E. Bleier, Comparison of ELF/VLF magnetic data from the DEMETER/IMSC instrument for large earthquakes, XXIX General Assembly of the International Union of Radio Science (URSI), Chicago, August 2008.
8. Bortnik, J., Electron interactions with intense chorus: random walks, giant leaps, and everything in-between, UCLA E&S Sci. M288C and A&O Sci. M275C joint seminar, Apr. 2008.
9. Bortnik, J., R. M. Thorne and N. P. Meredith, The origin of plasmaspheric hiss, Institute of Geophysics and Planetary Physics, Astrophysics Seminar, University of California, Riverside, Feb. 13th 2008. [INVITED SEMINAR]
10. Bortnik, J., R. M. Thorne and N. P. Meredith, The origin of plasmaspheric hiss, or, how to (accidentally) solve a 40-year old problem, Institute of Geophysics and Planetary Physics Colloquim, University of California, Los Angeles, Feb. 5th 2008. [INVITED SEMINAR]

11. Bleier, T., J. Bortnik, J. W. Cutler, and C. Dunson, The possible statistical relation of Pc1 pulsations to earthquake occurrence at low latitudes, *Eos. Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract S42B-08, 2007.
12. Li, W., R. M. Thorne, J. Bortnik, N. P. Meredith, and R. B. Horne, Calculation of path-integrated growth of whistler-mode chorus waves with the HOTRAY code based on CRRES observations, *Eos. Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract SM21A-0330, 2007.
13. Kulkarni, P., U. S. Inan, T. F. Bell, and J. Bortnik, Dependence of whistler-mode wave induced electron precipitation on k-vector direction, *Eos. Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract SM33B-1340, 2007.
14. Bortnik, J., R. M. Thorne, and N. P. Meredith, The origin of plasmaspheric hiss, *Eos. Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract SM14B-05, 2007. (SESSION CO-ORGANIZER and CO-CONVENER)
15. Bortnik, J., R. M. Thorne, and N. P. Meredith, Modeling the global propagation characteristics of chorus waves, *10th International Seminar "Low frequency wave processes in space plasma"*, Russian Academy of Sciences, Zvenigorod, Moscow, Nov. 12th - 15th 2007. [INVITED TALK/SESSION CHAIR]
16. Bortnik, J., R. M. Thorne, and N. P. Meredith, Modeling the propagation characteristics of chorus and its effect on the radiation-belts, *Rarotonga Energetic Particle Workshop (REPW 2007)*, 6th – 10th 2007, Rarotonga, Cook Islands. [INVITED TALK]
17. Bortnik, J., R. M. Thorne, and N. P. Meredith, Ray tracing model of ELF/VLF chorus and comparison to observations, *IUGG XXIV General Assembly*, July 2nd – 13th 2007, Perugia, Italy. [INVITED TALK]
18. Bortnik, J., J. W. Cutler, C. Dunson, T. E. Bleier, Statistical relation of Pc1 pulsations at low latitude to Earthquake occurrence, *IUGG XXIV General Assembly*, July 2nd – 13th 2007, Perugia, Italy.
19. Bortnik, J., R. M. Thorne, and N. P. Meredith, Modeling the global characteristics of chorus propagation, *Geospace Environment Modeling 2007*, June 17th – 22nd 2007, Zermatt Resort, Utah.
20. Bortnik, J., R. M. Thorne, and N. P. Meredith, Ray tracing of penetrating chorus and its implications for radiation belt electrons, *Rice University Space Physics Seminar*, Mar. 12th 2007, Rice University, Houston, Texas. [INVITED SEMINAR]
21. Bortnik, J., R. M. Thorne, and N. P. Meredith, Ray tracing of penetrating chorus and its implications for radiation belt electrons, *8th International School/Symposium for Space Simulations (ISSS8)*, Feb. 25th – Mar. 3rd 2007, Kauai, Hawaii.
22. Bortnik, J., R. M. Thorne, and N. P. Meredith, Ray tracing of penetrating chorus and its implications for radiation belt electrons, UCLA E&S Sci. M288B and A&O Sci. M275B joint seminar, Feb. 2007.
23. Ford, C. V., J. Bortnik, J. W. Cutler, C. Dunson, and T. E. Bleier, An automatic wave detection algorithm applied to Pc1 pulsations in California, and results of a 6-year statistical survey, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract SM43D-06 (Oral paper presented by J. Bortnik).
24. Bortnik, J., C. Dunson, J. W. Cutler, T. E. Bleier, Statistical analysis of ELF/VLF magnetic data from the DEMETER/IMSC instrument for large Earthquakes, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract T34B-07, Dec. 2006 (Oral paper presented by J. Bortnik).
25. Cutler, J. W., J. Bortnik, C. Dunson, J. Doering, and T. Bleier, CalMagNet - an Array of Search Coil Magnetometers Monitoring ULF Activity in California, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract T31A-0434.
26. Dunson, J. C., J. Doering, T. Bleier, J. Cutler, and J. Bortnik, ULF Pc 3-4 Pulsations: Observations, Processing, and Characterization in the California Region, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract T31A-0435, Dec. 2006.
27. Spittler, C., J. Bortnik, and R. M. Thorne, Influence of Corotating Interaction Regions in the Solar Wind on Relativistic Electron Microburst Precipitation, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract SM43B-1487, Dec. 2006.
28. Bleier, T. E., J. W. Cutler, C. Dunson, J. Bortnik, E. Calais, T. Dautermann, and M. Maniscalo, A Strategy for Collecting and Analyzing Multiple Electromagnetic (EM) Data

Sets for Pre- Earthquake Signal Investigations, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract T31A-0439, Dec. 2006.

29. Engebretson, M. J., M. R. Lessard, A. T. Weatherwax, D. L. Detrick, J. C. Green, J. Bortnik, J. L. Posch, N. J. Petit, M. C. Rose, and R. B. Horne, Pc 1-2 Waves and Energetic Particle Precipitation During and After Magnetic storms: Superposed Epoch Analysis and a Case Study, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract SM41B-1463, Dec. 2006.
30. Bortnik J., R. M. Thorne, and N. P. Meredith, Ray tracing of penetrating chorus and its implications for the radiation belts, presented at the 2nd VERSIM workshop, Sodankyla Geophysical Observatory, Sodankyla, Finland, 26th – 30th Sept. 2006.
31. Rodger, C. J., M. A. Clilverd, D. Nunn, P. T. Verronen, J. Bortnik, and E Turunen, Ground based observations of relativistic electron precipitation from the radiation belts, presented at the 2nd VERSIM workshop, Sodankyla Geophysical Observatory, Sodankyla, Finland, 26th – 30th Sept. 2006.
32. Bortnik J., R. M. Thorne, and N. P. Meredith, Modeling chorus propagation characteristics using CRRES suprathermal fluxes (poster), presented at the International Symposium on Recent Observations and Simulations of the Sun-Earth System (ISROSES), Varna, Bulgaria, 17th – 22nd Sept. 2006.
33. Rodger, C. J., M. A. Clilverd, P. T. Verronen, D. Nunn, J. Bortnik, E. Turunen, and T. Ulich, Ground based detection of relativistic electron microbursts (poster), *Eos Trans.,* Vol. 87, No. 36, West. Pac. Geophys. Suppl., Abstract SM21A-0103, July 24-27, 2006.
34. Bortnik J., C. Dunson, J. W. Cutler, and T. E. Bleier, Comparison of ELF/VLF magnetic data from the DEMETER/IMSC instrument for large earthquakes with and without preseismic activity, International Symposium DEMETER, Toulouse, France, June 14-16, 2006.
35. Bortnik J., The dual role of VLF waves (chorus) in the acceleration and precipitation of radiation belt electrons, UCLA E&S Sci. M288C and A&O Sci. M275C joint seminar [INVITED TALK + SEMINAR CHAIR].
36. Spittler, C., J. Bortnik, R. M. Thorne, Influence of solar wind on relativistic electron microburst precipitation, IM/S session, Geospace Environment Modeling (GEM) summer workshop, Snomass, Co., June 25-30, 2006.
37. Bortnik J., The dual role of VLF waves in the acceleration and precipitation of radiation belt electrons, Workshop: Global aspects of magnetosphere-ionosphere coupling, Yosemite CA., February 2006 [INVITED TALK].
38. Spittler, C., R. M. Thorne, J. Bortnik, T. P. O'Brien, Influence of Corotating Interaction Regions in the Solar Wind on Electron Microburst Precipitation, Workshop: Global Aspects of Magnetosphere-Ionosphere Coupling, Yosemite, CA, Feb. 2006
39. Bortnik J. and R.M. Thorne, Evolution of lightning-generated magnetospherically reflecting whistler waves into an incoherent noise band, URSI National Radio Science meeting, Boulder Colorado, Jan 2006 [INVITED TALK + SESSION CHAIR].
40. Bortnik J., J.W. Cutler, C. Dunson, and T. Bleier, Observations of residual ULF signals from the Parkfield magnetometer surrounding large earthquakes, *Eos Trans.* AGU, 86 (52), Fall Meet. Suppl., Abstract T51B-1344, Dec. 2005.
41. Bortnik J., and Thorne R. M., Numerical modeling of chorus-driven precipitation micro-bursts, XXVIIIth URSI General Assembly, Paper COM8-0413-2005, New Delhi, India, Oct. 2005 [YOUNG SCIENTIST AWARD]
42. Bortnik J., and Thorne R. M., Observation of two distinct, rapid loss-mechanisms during the Nov. 20th 2003 magnetic storm, Geospace Environment Modeling (GEM) Workshop, Santa Fe, New Mexico, June 2005 [SESSION CHAIR]
43. Thorne, R. M., J. Bortnik, Y. Y. Shprits, and T. P. O'Brien, The effects of both ULF and EMIC waves on relativistic electron dynamics during storms, Chapman conference on Magnetospheric ULF waves, San Diego, CA. March 2005 [INVITED TALK].
44. Bortnik J., and Thorne R. M., Radiation-belt losses due to EMIC waves as observed on the SAMPEX satellite, Workshop on Energetic Electron Radiation Belt Dynamics, Hermanus Magnetic Observatory, Hermanus, South Africa, March, 2005
45. Bortnik J. and Bleier T., Full wave calculation of the source characteristics of seismogenic electromagnetic signals as observed at LEO satellite altitudes, No. IP-18, International Workshop on Seismo-Electromagnetics (IWSE), Chofu, Japan, March 2005

46. Bortnik J., and Thorne R. M., Numerical modeling of chorus propagation and chorus-driven precipitation micro-bursts, URSI – National Radio Science Meeting, Colorado, Jan 2005 [INIVTED TALK]
47. Bortnik J. and Bleier T., Full wave calculation of the source characteristics of seismogenic electromagnetic signals as observed at LEO satellite altitudes, , *Eos. Trans.* AGU, 85(47), Fall Meeting Suppl., Abstract T51B-0453, Dec 2004
48. Bortnik J., U. S. Inan, and T. F. Bell, The effect of lightning source latitude upon the global precipitation signature driven by magnetospherically reflecting whistler waves*, Eos. Trans*. AGU, 85(28), West. Pac. Geophys. Suppl., Abstract SM31A-37, Hawaii, Aug 2004
49. Bortnik, J., Inan, U. S., Bell, T. F. Lifetime estimates of energetic radiation belt electrons driven by lightning-generated magnetospherically reflecting whistler waves, URSI National Radio Science Meeting, Colorado, Jan 2004
50. Bortnik J., U. S. Inan, and T. F. Bell, Precipitation signatures and lifetime estimates of energetic radiation-belt electrons scattered by magnetospherically-reflecting whistler waves, *Eos. Trans.* AGU, 84(46) Fall Meet. Suppl., Abstract SM42C-0622, Dec 2003 [AGU OUTSTANDING STUDENT PAPER AWARD]
51. Bortnik J., Precipitation of energetic electrons from the Earth's radiation belts due to lightning-generated very low frequency waves, Naval Research Laboratories Invited talk, Washington DC, Oct. 11, 2003
52. Bortnik J., Precipitation of energetic electrons from the Earth's radiation belts due to lightning-generated very low frequency waves, EE350 Radioscience seminar, Stanford University, Palo Alto, CA., Mar. 12th, 2003, (Ph.D. Oral defense)
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