# Other Publications – May 17, 2005


[1] A. Betz and J. S. Zmuidzinas, "A 150 $\mu$m to 500 $\mu$m heterodyne spectrometer for airborne astronomy," in *Airborne Astronomy Symposium Proceedings*, vol. NASA CP–2353, pp. 320–329, Washington, DC: NASA, Dec. 1984.

[2] J. Zmuidzinas, A. L. Betz, and R. T. Boreiko, "Simple corner-reflector mixer for submillimeter wavelengths," *J. Opt. Soc. Am.*, vol. 3, p. 12, Dec. 1986.

[3] J. Zmuidzinas, *Far-infrared heterodyne spectroscopy of neutral and ionized carbon in the interstellar medium.* PhD thesis, University of California, Berkeley, 1987.

[4] A. L. Betz, R. T. Boreiko, and J. Zmuidzinas, "Heterodyne spectroscopy of C II in molecular clouds," in *Proc. International Symposium on Submillimeter and Millimeter Astronomy* (A. Watt and A. Webster, eds.), pp. 117–121, Kluwer, 1988.

[5] J. Zmuidzinas, F. Sharifi, D. J. van Harlingen, and K. Y. Lo, "Small–area niobium/aluminum oxide/niobium junctions for SIS mixers," in *Proc. International Symposium on Submillimeter and Millimeter Astronomy* (A. Watt and A. Webster, eds.), Kluwer, 1988.

[6] J. Zmuidzinas and H. G. LeDuc, "A 500 GHz quasi–optical slot antenna SIS mixer," in *Superconducting devices and their applications* (H. Koch and H. Lübbig, eds.), pp. 395–398, Springer, 1991.

[7] J. Zmuidzinas and H. G. LeDuc, "Quasi–optical slot antenna SIS mixers," in *The Second International Symposium on Space Terahertz Technology: Symposium Proceedings*, (Jet Propulsion Laboratory, Pasadena, CA), p. 481, Mar. 1991.

[8] R. Schoelkopf, T. Phillips, and J. Zmuidzinas, "Noise in Josepson effect mixers and the RSJ model," in *The Third International Symposium on Space Terahertz Technology: Symposium Proceedings*, (University of Michigan, Ann Arbor, MI), p. 419, 1992.

[9] J. Zmuidzinas, H. G. Leduc, and J. A. Stern, "Slot antenna SIS mixers for submillimeter wavelengths," in *The Third International Symposium on Space Terahertz Technology: Symposium Proceedings*, (University of Michigan, Ann Arbor, MI), p. 234, 1992.

[10] R. J. Schoelkopf, T. G. Phillips, and J. Zmuidzinas, "Josephson–effect mixers using shunted Nb and NbN tunnel junctions," in *The Fourth International Symposium on Space Terahertz Technology: Symposium Proceedings*, (University of California, Los Angeles, CA), pp. 442–456, Mar. 1993.

[11] J. Zmuidzinas, J. Carlstrom, D. Miller, and N. G. Ugras, "The Caltech airborne submillimeter SIS receiver," in *Airborne Astronomy Symposium on the Galactic Ecosystem:*

*From Gas to Stars to Dust* (M. R. Haas, J. A. Davidson, and E. F. Erickson, eds.), vol. 73, (San Francisco), pp. 555–558, Astronomical Society of the Pacific, 1995.

[12] J. Zmuidzinas, G. A. Blake, J. Carlstrom, J. Keene, D. Miller, P. Schilke, and N. G. Ugras, "Submillimeter spectroscopy of interstellar hydrides," in *Airborne Astronomy Symposium on the Galactic Ecosystem: From Gas to Stars to Dust* (M. R. Haas, J. A. Davidson, and E. F. Erickson, eds.), vol. 73, (San Francisco), pp. 33–40, Astronomical Society of the Pacific, 1995.

[13] M. C. Gaidis, M. Bin, D. Miller, J. Zmuidzinas, H. G. LeDuc, and J. A. Stern, "Design and characterization of two–junction tuning circuits for submillimeter SIS mixers," in *The Sixth International Symposium on Space Terahertz Technology: Symposium Proceedings*, (California Institute of Technology, Pasadena, CA), pp. 305–313, Mar. 1995.

[14] J. Zmuidzinas, M. Bin, A. Clapp, M. Gaidis, D. Miller, and J. Ward, "Quasioptical SIS mixers in submillimeter astronomy (invited),," in *Extended Abstracts of the Fifth Intl. Superconductive Electronics Conference (ISEC '95)*, pp. 315–318, Sept. 1995.

[15] M. Bin, M. C. Gaidis, D. Miller, J. Zmuidzinas, T. G. Phillips, and H. G. LeDuc, "Design and characterization of a quasi-optical SIS receiver for the 1 THz band," in *The Seventh International Symposium on Space Terahertz Technology: Symposium Proceedings*, (University of Virginia, Charlottesville, VA), pp. 549–560, Mar. 1996.

[16] J. Zmuidzinas, "Recent progress in submillimeter heterodyne receiver development (invited)," in *Submillimeter and far–infrared space instrumentation: 30th ESLAB Symposium Proceedings*, vol. ESA SP–388, (ESTEC, Noordwijk, The Netherlands), pp. 151–154, Dec. 1996.

[17] J. Carlstrom and J. Zmuidzinas, "Millimeter and submillimeter techniques," in *Review of Radio Science 1993–1996* (W. R. Stone, ed.), pp. 839–882, Oxford University Press, June 1996.

[18] J. W. Kooi, J. A. Stern, G. Chattodpadhyay, H. G. LeDuc, B. Bumble, and J. Zmuidzinas, "Low–loss NbTiN films for THz SIS mixer tuning circuits," in *The Eighth International Symposium on Space Terahertz Technology: Symposium Proceedings* (R. Blundell and E. Tong, eds.), (Harvard–Smithsonian Center for Astrophysics, Cambridge, MA), pp. 310–318, 1997.

[19] J. W. Kooi, J. A. Stern, G. Chattodpadhyay, H. G. LeDuc, B. Bumble, and J. Zmuidzinas, "Low–loss NbTiN films for THz SIS mixer tuning circuits," in *Ninth International Symposium on Space Terahertz Technology: Symposium Proceedings*, (Jet Propulsion Laboratory, Pasadena, CA), pp. 283–294, Mar. 1998.

[20] J. A. Stern, B. Bumble, H. G. LeDuc, J. W. Kooi, and J. Zmuidzinas, "Fabrication and DC characterization of NbTiN based SIS mixers for use between 600 and 1200 GHz," in *Ninth International Symposium on Space Terahertz Technology: Symposium Proceedings*, (Jet Propulsion Laboratory, Pasadena, CA), pp. 305–313, Mar. 1998.

[21] K. G. Isaak, A. I. Harris, and J. Zmuidzinas, "WASP: a wideband analog correlator spectrometer," in *Ninth International Symposium on Space Terahertz Technology: Symposium Proceedings*, (Jet Propulsion Laboratory, Pasadena, CA), pp. 615–623, Mar. 1998.

[22] J. W. Kooi, J. A. Stern, G. Chattodpadhyay, H. G. LeDuc, B. Bumble, and J. Zmuidzinas, "Low–loss NbTiN films for THz SIS mixer tuning circuits," *Int. J. IR and MM Waves*, vol. 19, pp. 373–383, 1998.

[23] J. Zmuidzinas, J. W. Kooi, J. Kawamura, G. Chattodpadhyay, J. A. Stern, B. Bumble, and H. G. LeDuc, "Development of SIS mixers for 1 THz," *Proc. SPIE*, vol. 3357, pp. 53–61, May 1998.

[24] J. Glenn, J. J. Bock, G. Chattopadhyay, S. F. Edgington, A. E. Lange, J. Zmuidzinas, P. D. Mauskopf, B. Rownd, L. Yuen, and P. A. R. Ade, "Bolocam: a millimeter–wave bolometric camera," *Proc. SPIE*, vol. 3354, pp. 326–334, May 1998.

[25] T. de Graauw et al., "Heterodyne instrument for FIRST (HIFI): preliminary design," *Proc. SPIE*, vol. 3357, pp. 336–347, May 1998.

[26] A. I. Harris, K. G. Isaak, and J. Zmuidzinas, "WASP: a wideband spectrometer for heterodyne spectroscopy," *Proc. SPIE*, vol. 3357, pp. 384–394, May 1998.

[27] J. Zmuidzinas, "Progress in coherent detection methods (invited)," in *The Physics and Chemistry of the Interstellar Medium* (V. Ossenkopf et al., ed.), pp. 423–430, U. Cologne, GCA–Verlag Herdecke, 1999.

[28] J. Kawamura, D. Miller, J. Kooi, J. Chen, J. Zmuidzinas, B. Bumble, H. G. LeDuc, and J. A. Stern, "Submillimeter SIS mixers using high current density Nb/AlN/Nb tunnel junctions and NbTiN films," in *Tenth International Symposium on Space Terahertz Technology: Symposium Proceedings*, (Charlottesville, VA), University of Virginia, Mar. 1999.

[29] J. Ward, F. Rice, G. Chattopadhyay, and J. Zmuidzinas, "Supermix: a flexible software library for high-frequency circuit simulation, including SIS mixers and superconducting components," in *Tenth International Symposium on Space Terahertz Technology: Symposium Proceedings*, (Charlottesville, VA), pp. 268–281, University of Virginia, Mar. 1999.

[30] F. Rice, J. Ward, J. Zmuidzinas, and G. Chattopadhyay, "Fast harmonic balance of SIS mixers with multiple junctions and superconducting circuits," in *Tenth International Symposium on Space Terahertz Technology: Symposium Proceedings*, (Charlottesville, VA), pp. 282–297, University of Virginia, Mar. 1999.

[31] G. Chattopadhyay, D. Miller, H. G. LeDuc, and J. Zmuidzinas, "A 550 GHz dual–polarized quasioptical SIS mixer," in *Tenth International Symposium on Space Terahertz Technology: Symposium Proceedings*, (Charlottesville, VA), pp. 130–143, University of Virginia, Mar. 1999.

[32] K. Isaak, A. I. Harris, and J. Zmuidzinas, "WASP: A 3250 MHz bandwidth correlator for heterodyne spectroscopy," in *Highly Redshifted Radio Lines, ASP Conf. Series Vol. 156, Ed. by C. L. Carilli, S. J. E. Radford, K. M. Menten, & G. I. Langston. ISBN 1-886733-76-7*, p. 86, 1999.

[33] P. Teuben, A. Harris, K. Isaak, J. Morgan, and J. Zmuidzinas, "Real-time Linux driving a spectrometer," in *Astronomical Data Analysis Software and Systems VIII, ASP Conference Series, Vol. 172. Ed. David M. Mehringer, Raymond L. Plante, and Douglas A. Roberts. ISBN: 1-886733-94-5 (1999)*, vol. 8, p. 99, 1999.

[34] M. Bin, D. J. Benford, M. C. Gaidis, T. H. Büttgenbach, J. Zmuidzinas, E. Serabyn, and T. G. Phillips, "A large throughput high resolution Fourier transform spectrometer for submillimeter applications," *Int. J. IR and MM Waves*, vol. 20, pp. 383–400, 1999.

[35] M. L. Edgar and J. Zmuidzinas, "CASIMIR: a submillimeter heterodyne spectrometer for SOFIA," in *Airborne Telescope Systems* (R. K. Melugin and H.-P. Roeser, eds.), vol. 4014 of *SPIE Proc.*, pp. 31–42, June 2000.

[36] A. Karpov, D. Miller, F. Rice, J. Zmuidzinas, B. Bumble, J. A. Stern, and H. G. LeDuc, "Low noise 1.2 THz SIS receiver," in *Extended Abstracts of the Eighth International Superconductive Electronics Conference (ISEC'01)*, (Osaka, Japan), June 2001.

[37] J. J. Bock, A. Goldin, C. Hunt, A. E. Lange, H. G. LeDuc, P. K. Day, A. Vayonakis, and J. Zmuidzinas, "Integrated focal plane arrays of millimeter-wave astronomy," in *Ninth International Workshop on Low Temperature Detectors* (F. S. Porter, D. McCammon, M. Galeazzi, and C. K. Stahle, eds.), vol. 605 of *AIP Conf. Proc.*, pp. 243–246, New York: AIP, 2002.

[38] A. Goldin, J. J. Bock, C. Hunt, A. E. Lange, H. G. LeDuc, P. K. Day, A. Vayonakis, and J. Zmuidzinas, "SAMBA: Superconducting antenna–coupled multi–frequency bolometric array," in *Ninth International Workshop on Low Temperature Detectors* (F. S. Porter, D. McCammon, M. Galeazzi, and C. K. Stahle, eds.), vol. 605 of *AIP Conf. Proc.*, pp. 251–254, New York: AIP, 2002.

[39] B. A. Mazin, P. K. Day, J. Zmuidzinas, and H. G. LeDuc, "Multiplexable kinetic inductance detectors," in *Ninth International Workshop on Low Temperature Detectors* (F. S. Porter, D. McCammon, M. Galeazzi, and C. K. Stahle, eds.), vol. 605 of *AIP Conf. Proc.*, pp. 309–312, New York: AIP, 2002.

[40] A. Vayonakis, C. Luo, H. G. LeDuc, R. Schoelkopf, and J. Zmuidzinas, "The millimeter-wave properties of superconducting microstrip lines," in *Ninth International Workshop on Low Temperature Detectors* (F. S. Porter, D. McCammon, M. Galeazzi, and C. K. Stahle, eds.), vol. 605 of *AIP Conf. Proc.*, pp. 539–542, New York: AIP, 2002.

[41] J. J. Gromke, C. M. Bradford, J. J. Bock, M. Dragovan, L. Duband, L. Earle, J. Glenn, H. Matsuhara, B. J. Naylor, H. Nguyen, and J. Zmuidzinas, "Z–Spec: A mm–wave spectrometer for measuring redshifts of submillimeter galaxies," in *Ninth International Workshop on Low Temperature Detectors* (F. S. Porter, D. McCammon, M. Galeazzi, and C. K. Stahle, eds.), vol. 605 of *AIP Conf. Proc.*, pp. 543–546, New York: AIP, 2002.

[42] J. Zmuidzinas, B. Mazin, A. Vayonakis, P. Day, and H. G. LeDuc, "Multiplexable kinetic inductance detectors," in *Proceedings far–IR, sub–mm, and mm detector workshop* (J. Wolf, J. Farhoomand, and C. R. McCreight, eds.), vol. NASA CP/211408, Washington, DC: NASA, 2002. in press.

[43] J. Zmuidzinas, "Coherent detection and SIS mixers," in *Proceedings far–IR, sub–mm, and mm detector workshop* (J. Wolf, J. Farhoomand, and C. R. McCreight, eds.), vol. NASA CP/211408, Washington, DC: NASA, 2002. in press.

[44] A. Karpov, D. Miller, J. Zmuidzinas, J. A. Stern, B. Bumble, and H. G. LeDuc, "Low noise SIS mixer for the frequency above 1 THz," in *Proceedings far–IR, sub–mm, and mm detector workshop* (J. Wolf, J. Farhoomand, and C. R. McCreight, eds.), vol. NASA CP/211408, Washington, DC: NASA, 2002. in press.

[45] J. J. Bock, P. Day, A. Goldin, H. G. LeDuc, C. Hunt, A. Lange, A. Vayonakis, and J. Zmuidzinas, "Antenna–coupled bolometer arrays for astrophysics," in *Proceedings far–IR, sub–mm, and mm detector workshop* (J. Wolf, J. Farhoomand, and C. R. McCreight, eds.), vol. NASA CP/211408, Washington, DC: NASA, 2002. in press.

[46] A. Goldin, J. J. Bock, C. Hunt, A. Lange, H. G. LeDuc, A. Vayonakis, and J. Zmuidzinas, "SAMBA: Superconducting antenna–coupled multi–frequency bolometric array," in *Proceedings far–IR, sub–mm, and mm detector workshop* (J. Wolf, J. Farhoomand, and C. R. McCreight, eds.), vol. NASA CP/211408, Washington, DC: NASA, 2002. in press.

[47] C. Hunt, A. Lange, A. Vayonakis, J. Zmuidzinas, J. J. Bock, P. K. Day, A. Goldin, and H. G. LeDuc, "Transition–edge superconducting antenna–coupled bolometer," in

*Proceedings far–IR, sub–mm, and mm detector workshop* (J. Wolf, J. Farhoomand, and C. R. McCreight, eds.), vol. NASA CP/211408, 2002. in press.

[48] A. Vayonakis, C. Luo, H. G. LeDuc, R. J. Schoelkopf, and J. Zmuidzinas, "The millimeter–wave properties of superconducting microstrip lines," in *Proceedings far–IR, sub–mm, and mm detector workshop* (J. Wolf, J. Farhoomand, and C. R. McCreight, eds.), vol. NASA CP/211408, Washington, DC: NASA, 2002. in press.

[49] C. M. Bradford, J. J. Bock, M. Dragovan, L. Earle, B. Naylor, H. Nguyen, and J. Zmuidzinas, "WaFIRS, a waveguide far–ir spectrometer: Enabling space–borne spectroscopy of high–$z$ galaxies in the far–ir and submm," in *Proceedings far–IR, sub–mm, and mm detector workshop* (J. Wolf, J. Farhoomand, and C. R. McCreight, eds.), vol. NASA CP/211408, Washington, DC: NASA, 2002. in press.

[50] M. Sumner, A. Blain, A. Harris, R. Hu, H. G. LeDuc, D. Miller, F. Rice, S. Weinreb, and J. Zmuidzinas, "A wide–bandwidth, low–noise SIS receiver design for millimeter and submillimeter wavelengths," in *Proceedings far–IR, sub–mm, and mm detector workshop* (J. Wolf, J. Farhoomand, and C. R. McCreight, eds.), vol. NASA CP/211408, Washington, DC: NASA, 2002. in press.

[51] B. A. Mazin, P. K. Day, H. G. Leduc, A. Vayonakis, and J. Zmuidzinas, "Superconducting kinetic inductance photon detectors," in , vol. 4849 of *SPIE Proc.*, pp. 283–293, Dec. 2002.

[52] J. C. Pearson, I. Mehdi, E. Schlecht, F. Maiwald, A. Maestrini, J. J. Gill, S. C. Martin, D. Pukala, J. Ward, J. Kawamura, W. R. McGrath, W. Hatch, D. G. Harding, H. G. LeDuc, J. A. Stern, B. Bumble, L. A. Samoska, T. C. Gaier, R. Ferber, D. Miller, A. Karpov, J. Zmuidzinas, T. G. Phillips, N. R. Erickson, J. Swift, Y. Chung, R. Lai, and H. Wang, "THz frequency receiver instrumentation for Herschel's heterodyne instrument for far infrared (HIFI)," in *IR Space Telescopes and Instruments* (J. C. Mather, ed.), vol. 4850 of *SPIE Proc.*, pp. 650–661, Mar. 2003.

[53] C. M. Bradford, B. J. Naylor, J. Zmuidzinas, J. J. Bock, J. Gromke, H. Nguyen, M. Dragovan, M. Yun, L. Earle, J. Glenn, H. Matsuhara, P. A. R. Ade, and L. Duband, "WaFIRS: a waveguide far-IR spectrometer: enabling spectroscopy of high–$z$ galaxies in the far-IR and submillimeter," in *IR Space Telescopes and Instruments* (J. C. Mather, ed.), vol. 4850 of *SPIE Proc.*, pp. 1137–1148, Mar. 2003.

[54] A. Goldin, J. J. Bock, C. L. Hunt, A. E. Lange, H. G. LeDuc, A. Vayonakis, and J. Zmuidzinas, "Design of broadband filters and antennas for SAMBA," in *Millimeter and Submillimeter Detectors for Astronomy* (T. G. Phillips and J. Zmuidzinas, eds.), vol. 4855 of *SPIE Proc.*, pp. 163–171, Feb. 2003.

[55] B. J. Naylor, P. A. R. Ade, J. J. Bock, C. M. Bradford, M. Dragovan, L. Duband, L. Earle, J. Glenn, H. Matsuhara, H. Nguyen, M. Yun, and J. Zmuidzinas, "Z-Spec: a broadband, direct-detection, millimeter-wave spectrometer," in *Millimeter and Submillimeter Detectors for Astronomy* (T. G. Phillips and J. Zmuidzinas, eds.), vol. 4855 of *SPIE Proc.*, pp. 239–248, Feb. 2003.

[56] J. W. Kooi, A. Kovacs, S. M. Kaye, J. Dama, M. L. Edgar, J. Zmuidzinas, and T. G. Phillips, "Heterodyne Instrumentation Upgrade at the Caltech Submillimeter Observatory," in *Millimeter and Submillimeter Detectors for Astronomy* (T. G. Phillips and J. Zmuidzinas, eds.), vol. 4855 of *SPIE Proc.*, pp. 265–278, Feb. 2003.

[57] F. Rice, M. Sumner, J. Zmuidzinas, R. Hu, H. G. LeDuc, A. I. Harris, and D. Miller, "SIS mixer design for a broadband millimeter spectrometer suitable for rapid line surveys and redshift determinations," in *Millimeter and Submillimeter Detectors for Astronomy* (T. G. Phillips and J. Zmuidzinas, eds.), vol. 4855 of *SPIE Proc.*, pp. 301–311, Feb. 2003.

[58] C. L. Hunt, J. J. Bock, P. K. Day, A. Goldin, A. E. Lange, H. G. LeDuc, A. Vayonakis, and J. Zmuidzinas, "Transition-edge superconducting antenna-coupled bolometer," in *Millimeter and Submillimeter Detectors for Astronomy* (T. G. Phillips and J. Zmuidzinas, eds.), vol. 4855 of *SPIE Proc.*, pp. 318–321, Feb. 2003.

[59] J. Zmuidzinas, "The role of coherent detection (invited)," in *New Concepts for Far–Infrared and Submillimeter Space Astronomy* (D. Benford and D. Leisawitz, eds.), vol. NASA CP–2003–212233, p. 329, Washington, DC: NASA, 2003. in press.

[60] J. Bock, C. Bradford, L. Earle, J. Glenn, B. Naylor, H. Nguyen, and J. Zmuidzinas, "The case for space–borne far–infrared line surveys," in *New Concepts for Far–Infrared and Submillimeter Space Astronomy* (D. Benford and D. Leisawitz, eds.), vol. NASA CP–2003–212233, p. 205, Washington, DC: NASA, 2003. in press.

[61] C. Bradford, J. Bock, M. Dragovan, L. Earle, J. Glenn, B. Naylor, H. Nguyen, and J. Zmuidzinas, "Wafirss, a waveguide far–ir/submillimeter spectrometer: Enabling space–borne spectroscopy of high–$z$ galaxies in the far–ir and submm," in *New Concepts for Far–Infrared and Submillimeter Space Astronomy* (D. Benford and D. Leisawitz, eds.), vol. NASA CP–2003–212233, p. 295, Washington, DC: NASA, 2003. in press.

[62] C. Bradford and J. Zmuidzinas, "The future of far–IR /submillimeter astrophysics with single–dish telescopes," in *The Dense Interstellar Medium in Galaxies: Proceedings of the 4th Cologne–Bonn–Zermatt Symposium* (C. Kramer and J. Stutzki, eds.), p. 323, Springer, 2004.

[63] P. K. Day, H. G. LeDuc, A. Goldin, C. D. Dowell, and J. Zmuidzinas, "Far-infrared/submillimeter imager-polarimeter using distributed antenna-coupled transition

edge sensors," in *Millimeter and Submillimeter Detectors for Astronomy II* (J. Zmuidzinas, W. S. Holland, and S. Withington, eds.), vol. 5498 of *SPIE Proc.*, pp. 857–865, Oct. 2004.

[64] A. Karpov, D. Miller, F. R. Rice, J. A. Stern, B. Bumble, H. G. LeDuc, and J. Zmuidzinas, "Low-noise SIS mixer for far-infrared radio astronomy," in *Millimeter and Submillimeter Detectors for Astronomy II* (J. Zmuidzinas, W. S. Holland, and S. Withington, eds.), vol. 5498 of *SPIE Proc.*, pp. 616–621, Oct. 2004.

[65] J. C. Pearson, I. Mehdi, J. S. Ward, F. W. Maiwald, R. R. Ferber, H. G. LeDuc, E. T. Schlecht, J. J. Gill, W. A. Hatch, J. H. Kawamura, J. A. Stern, T. C. Gaier, L. A. Samoska, S. Weinreb, B. Bumble, D. M. Pukala, H. H. Javadi, B. P. Finamore, R. H. Lin, R. J. Dengler, J. R. Velebir, E. M. Luong, R. Tsang, A. Peralta, M. Wells, W. Chun, J. Zmuidzinas, A. Karpov, T. Phillips, D. Miller, A. E. Maestrini, N. Erickson, G. Swift, K. T. Liao, and M. Paquette, "THz instrumentation for the Herschel Space Observatory's heterodyne instrument for far infrared," in *Millimeter and Submillimeter Detectors for Astronomy II* (J. Zmuidzinas, W. S. Holland, and S. Withington, eds.), vol. 5498 of *SPIE Proc.*, pp. 486–497, Oct. 2004.

[66] J. W. Kooi, A. Kovács, B. Bumble, G. Chattopadhyay, M. L. Edgar, S. Kaye, R. LeDuc, J. Zmuidzinas, and T. G. Phillips, "Heterodyne instrumentation upgrade at the Caltech Submillimeter Observatory," in *Millimeter and Submillimeter Detectors for Astronomy II* (J. Zmuidzinas, W. S. Holland, and S. Withington, eds.), vol. 5498 of *SPIE Proc.*, pp. 332–348, Oct. 2004.

[67] T. Herter, R. Brown, R. Giovanelli, G. J. Stacey, J. Zmuidzinas, D. P. Woody, S. Golwala, and A. Blain, "The large Atacama submillimeter telescope," in *Millimeter and Submillimeter Detectors for Astronomy II* (J. Zmuidzinas, W. S. Holland, and S. Withington, eds.), vol. 5498 of *SPIE Proc.*, pp. 55–62, Oct. 2004.

[68] C. M. Bradford, P. A. R. Ade, J. E. Aguirre, J. J. Bock, M. Dragovan, L. Duband, L. Earle, J. Glenn, H. Matsuhara, B. J. Naylor, H. T. Nguyen, M. Yun, and J. Zmuidzinas, "Z-Spec: a broadband millimeter-wave grating spectrometer: design, construction, and first cryogenic measurements," in *Millimeter and Submillimeter Detectors for Astronomy II* (J. Zmuidzinas, W. S. Holland, and S. Withington, eds.), vol. 5498 of *SPIE Proc.*, pp. 257–267, Oct. 2004.