

Raul A. Monsalve
Curriculum Vitae (Rev. Oct. 2018)

Email:

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Main affiliation:

Research Associate
Department of Physics
McGill University
3600 Rue University
Montreal, Quebec H3A 2T8
Canada

Main research interests: experimental cosmology – statistical data analysis – radio astronomy

Education:

Ph.D. in Physics, University of Miami Jun 2012
Thesis: “*Calibrations and Observations with the QUIET Radiotelescope*”,
Advisor: Joshua Gundersen
B.S. in Electronics Engineering, University of Concepción Feb 2007
Thesis: “*Study and Design of Radiofrequency Power Supply for Excitation of CO2 Laser*”,
Advisor: Sergio Torres

Current employment:

Research Associate, Department of Physics, McGill University Aug 2018 – present
Research Associate, McGill Space Institute, McGill University Aug 2018 – present
Visiting Researcher, School of Earth and Space Exploration, Arizona State University Jul 2016 – present
Visiting Researcher, Facultad de Ingeniería, UC de la Santísima Concepción Sep 2017 – present

Past employment:

Postdoctoral Associate, Center for Astrophysics and Space Astronomy, University of Colorado Jan 2016 – Mar 2018
Postdoctoral Associate, School of Earth and Space Exploration, Arizona State University Jul 2012 – Jun 2016
Teaching Assistant, Department of Physics, University of Miami Jan – Jun 2012
Research Assistant, Department of Physics, University of Miami Jul 2007 – Jun 2012
Research Assistant, Department of Electrical Engineering, University of Concepción Mar 2006 – May 2007
Research Assistant, Department of Physics, University of Concepción Mar 2006 – May 2007

Current and past projects:

Experiment to Detect the Global EoR Signature (EDGES) – PI: Judd D. Bowman, Arizona State University
Network for Exploration and Space Sciences (NESS) – PI: Jack O. Burns, University of Colorado Boulder
Dark Ages Radio Explorer (DARE) – PI: Jack O. Burns, University of Colorado Boulder
Medidor Autonomo de Radio Interferencia (MARI) – PI: Ricardo Bustos, UC Santísima Concepción
Q/U Imaging Experiment (QUIET) – PI: Bruce Winstein, University of Chicago

Research grants awarded:

(Co-PI) QUIMAL project 130005, National Commission of Scientific and Technological Research (CONICYT, Chile),
“*First step towards the construction of a Low-Frequency Telescope: RFI site-testing with MARI-UCSC*”, 2013-2015, USD
\$106,000

Courses, workshops, and summer schools attended:

“*Keysight RF Simulation Back to Basics Workshop*”, Chandler, AZ Apr 2015
“*14th NRAO Synthesis Imaging Workshop*”, NRAO Socorro May 2014
“*Penn State University Summer School in Statistics for Astronomers*”, Pennsylvania State University Jun 2013
“*Sixth NAIC/NRAO Summer School on Single Dish Radio Astronomy*”, NRAO Green Bank Jul 2011
“*Fundamentals of Industrial Lasers: Applications and Safety*”, CICESE Monterrey Sep 2006

Courses taught:

PHY 208, University Physics Laboratory, University of Miami Spring Semester 2012

Work visits:

Analysis of global redshifted 21-cm models with EDGES data Aug 2018
 Harvard-Smithsonian Center for Astrophysics
 Discussions with collaborators on low-frequency cosmology experiments Jun 2018
 Astrophysics and Cosmology Research Unit, University of KwaZulu-Natal
 Analysis of data from RFI survey in the Atacama desert, Dec 2015
 Department of Electrical Engineering, UC Santísima Concepción
 Analysis of data from RFI survey in the Atacama desert with MARI, Jan 2015
 Department of Electrical Engineering, UC Santísima Concepción
 Return loss measurements for the QUIET W-band feedhorn array, Jun 2008
 Department of Physics, Princeton University
 Pre-assembly and optical alignment of the QUIET radio telescope, May 2008
 Department of Astronomy, Caltech
 Development of stabilizer for Mach-Zender interferometer, Jun 2007
 Department of Experimental Physics, University of Sao Paulo
 Development of 100-W RF power supply at 100 MHz, CICESE Monterrey Aug – Dec 2006

Astronomical observation experience:

Low-frequency radio observations with EDGES 2013 – 2018
 Pulsar observations with LWA, 1 day remotely 2014
 Extragalactic observation with Arecibo, 1 day remotely 2011
 CMB polarization observations with QUIET, 115 days on site 2008 – 2011

Awards, memberships, peer review, service:

Member of the McGill Astro Seminar Committee 2018
 Session chair, AAS 231st meeting 2018
 Referee, The Astrophysical Journal 2013 – present
 Referee, Monthly Notices of the Royal Astronomical Society 2016 – present
 Full member, American Physical Society (APS) 2015 – present
 Full member, Institute of Electrical and Electronics Engineers (IEEE) 2014 – present
 Full member, American Astronomical Society (AAS) 2010 – present
 Award, Enrique Molina Garmendia scholarship, Universidad de Concepcion 2000
 Award, Padre Hurtado scholarship, Universidad Catolica de Chile (declined) 2000

Software knowledge:

Python, C, IDL, MATLAB, Mathcad, Mathematica, Latex

Mentoring:

Kent Ritchie, undergraduate research May 2017 – August 2017
 Department of Astrophysical and Planetary Sciences,
 University of Colorado at Boulder
 Katherine Pellicore, undergraduate research and thesis project March 2016 – April 2017
 Department of Astrophysical and Planetary Sciences,
 University of Colorado at Boulder
 Alexandra Suarez, undergraduate thesis project, March 2014 – January 2016
 Department of Physics, University of Concepcion

Outreach:

Expositor, STEM Open House Events, School of Earth and Space Exploration, 2012 – 2015
 Arizona State University
 Interviewee, TV Channel Telemundo Arizona 2014 – 2015
 Appearances, Chilean newspapers in relation to the MARI-UCSC project 2013 – 2014

Future talks, workshops, conferences, and visits:

- 2018, October 22-26, Visit, Kavli Institute for Cosmology, Cambridge, UK
 2018, November 26-30, Visit, Korea Astronomy and Space Science Institute, Daejeon, South Korea
 2018, December 3, Seminar Talk, Yukawa Institute for Theoretical Physics, Kyoto, Japan
 2018, December 4-6, Science at Low Frequencies V Conference, Nagoya University, Nagoya, Japan
 2019, January 7-9, URSI meeting, University of Colorado Boulder, Colorado, USA
 2019, March 3-9, Cosmosafari conference, South Africa
 2019, July 14-19, Barefoot EoR Conference, North Queensland, Australia

Past talks and posters:

- 53) ... Talk, Department of Physics NPA Seminar, Yale University, New Haven, USA, October 2018
"Constraining Cosmic Dawn and Reionization with the Global 21-cm Signal"
- 52) ... Invited Talk, IGM2018, Kavli IPMU, Kashiwa, Japan, September 2018
"An Absorption Profile in the Sky-Averaged Radio Spectrum"
- 51) ... Invited Talk, TeVPA 2018 Conference, Berlin, Germany, August 2018
"Fingerprints of the First Stars in the Sky-Averaged Radio Spectrum"
- 50) ... Invited Talk, Low-Noise Radio Receivers, Haystack Observatory, Massachusetts, USA, August 2018
"Measurements of Reflection Coefficient"
- 49) ... Talk, Rencontres du Vietnam, Windows on the Universe Conference, Quy Nhon, Vietnam, August 2018
"An Absorption Signal in the Sky-Averaged Radio Spectrum"
- 48) ... Invited Talk, Tremendous Radio Arrays Workshop, Brookhaven National Lab, New York, USA, July 2018
"EDGES Measurement of an Absorption Feature in the Global Radio Spectrum"
- 47) ... Talk, The Early Growth of Supermassive Black Holes Workshop, Sexten, Italy, July 2018
"Probing the First Galaxies and Black Holes with the Global Redshifted 21-cm Line"
- 46) ... Talk, Seminario Dipartimento di Fisica, Università degli Studi di Torino, Torino, Italy, June 2018
"Characterizing the Early Universe with the Sky-Averaged Radio Spectrum"
- 45) ... Invited Talk, Thermal History of the Universe at Intermediate Redshifts Workshop, CERN, Switzerland, June 2018
"An Absorption Feature in the Sky-Averaged Radio Spectrum"
- 44) ... Invited Talk, Rise and Shine: Galaxies in the Epoch of Reionization Conference, Strasbourg, France, June 2018
"Measuring the Global 21-cm Signal with EDGES"
- 43) ... Talk, NITheP Seminar, University of Kwazulu-Natal, Durban, South Africa, June 2018
"EDGES Detection of an Absorption Feature at 78 MHz in the Sky-Averaged Radio Spectrum"
- 42) ... Plenary Talk, CIPANP 2018 Conference, Indian Wells, USA, May 2018
"Fingerprints of the First Stars in the Sky-Averaged Radio Spectrum"
- 41) ... Talk, 2nd URSI Atlantic Radio Science Meeting, Gran Canaria, Spain, May 2018
"Extracting the Global Cosmological 21-cm Signal from EDGES Data using MCMC"
- 40) ... Invited Colloquium Talk, U. of Colorado Boulder, Boulder, CO, USA, March 2018,
"Detecting the Fingerprints of the First Stars"
- 39) ... Talk, Deep Space Gateway Science Workshop, Denver, CO, USA, February 2018,
"Telerobotic Deployment of a Lunar Farside Low Frequency Telescope from the Deep Space Gateway"
- 38) ... Talk, Cosmological Signals from Cosmic Dawn to Present, Aspen Center for Physics, February 2018,
"Characterizing the Epochs of Heating and Reionization with EDGES High-Band"
- 37) ... Talk, NRAO Socorro Colloquium, Socorro, New Mexico, USA, February 2018,
"Illuminating the Cosmic Dawn with Sky-Average Radio Measurements"
- 36) ... Talk, 231st American Astronomical Society Conference, National Harbor, Maryland, USA, January 2018,
"Characterizing the 21-cm Signal from Neutral Hydrogen in the IGM at Redshifts $27 > z > 6$ with EDGES"
- 35) ... Talk, Science at Low Frequencies IV, University of Sydney, Australia, December 2017,
"Recent Progress by the EDGES Global 21-cm Experiment"
- 34) ... Invited Talk, Radio Synchrotron Background Conference, University of Richmond, Richmond, Virginia, July 2017,
"Synchrotron Radiation as a Foreground to the Global Redshifted 21-cm Measurement by EDGES"
- 33) ... Talk, NASA Exploration Science Forum, NASA Ames, Mountain View, California, July 2017,
"Preparing for the Dark Ages Radio Explorer (DARE) through Ground-Based Observations"
- 32) ... Talk, Radio Astronomy Laboratory Seminar, UC Berkeley, Berkeley, California, July 2017,
"Current Developments and Constraints of Redshifted 21-cm Models by EDGES"

- 31) ... Astronomy Tea Talk, California Institute of Technology, Pasadena, California, April 2017,
"Constraints on Cosmic Dawn and the EoR from Global 21-cm Observations"
- 30) ... Talk, 229th American Astronomical Society Conference, Grapevine, Texas, USA, January 2017,
"The Properties of Primordial Stars and Galaxies Measured from the 21-cm Global Spectrum using DARE"
- 29) ... Poster, 229th American Astronomical Society Conference, Grapevine, Texas, USA, January 2017,
"Instrumental and Calibration Advancements for the Dark Ages Radio Explorer"
- 28) ... Talk, URSI-NRSM Conference, University of Colorado, Boulder, USA, January 2017,
"Precision Cosmological Measurements with DARE and EDGES"
- 27) ... Talk, Science at Low Frequencies III, Caltech, Pasadena, USA, December 2016,
"Constraining the Global Redshifted 21-cm Signal with EDGES in the Range $14.8 > z > 6.5$ "
- 26) ... Invited Talk, AeroSpace Ventures Day, LASP, Boulder, Colorado, October 27, 2016,
"The Dark Ages Radio Explorer (DARE)"
- 25) ... Invited Colloquium Talk, ITC-CfA Harvard University, Cambridge, Massachusetts, September 8, 2016,
"Constraining the Global 21-cm Signal from the Early Universe with EDGES and DARE"
- 24) ... Invited Luncheon Talk, ITC-CfA Harvard University, Cambridge, Massachusetts, September 8, 2016,
"Polarization in the Foregrounds for Global 21-cm Measurements"
- 23) ... Conference Talk, NASA Exploration Science Forum, NASA Ames, Mountain View, California, July 2016,
"The EDGES and DARE Precision Cosmology Experiments"
- 22) ... Talk, KIPAC Tea Talk, SLAC, Stanford University, Palo Alto, California, July 2016,
"Probing the large-scale evolution of the early Universe ($z > 6$) with the global redshifted 21-cm line"
- 21) ... Invited Conference Talk, CMB Spectral Distortions from Cosmic Baryon Evolution, RRI India, July 2016,
"Constraining the Global Redshifted 21-cm Signal with EDGES"
- 20) ... Talk, The Reionization Epoch: New Insights and Future, Aspen Center for Physics, March 2016,
"Latest Constraints on the Global Redshifted 21-cm EoR Signal from the EDGES Experiment"
- 19) ... Talk, URSI Conference, University of Colorado, Boulder, USA, January 2016,
"Preliminary Measurements with the EDGES Low-Band Instrument"
- 18) ... Talk, Science at Low Frequencies II, University of New Mexico, Albuquerque, USA, December 2015,
"Characterizing Cosmic Dawn with the Low-Band EDGES Instrument"
- 17) ... Talk, APS 4 Corners Section Meeting, Arizona State University, Tempe, USA, October 2015,
"Characterization of Cosmic Dawn through Observations of the Redshifted 21-cm Line"
- 16) ... Talk, Astrophysics Lunch Seminar, University of Colorado Boulder, Boulder, USA, September 2015,
"Characterization of Cosmic Dawn through Observations of the Redshifted 21-cm Line with EDGES"
- 15) ... Poster, IAU XXIX General Assembly, Honolulu, August 2015,
"EDGES: Experiment to Detect the Global EoR Signature"
- 14) ... Talk, Physics Colloquium, University of British Columbia, Vancouver, Canada, July 2015,
"The EDGES Experiment: Calibrations and Status"
- 13) ... Talk, IEEE APS/URSI North American Conference, Vancouver, Canada, July 2015,
"Characterization of the EDGES Receiver and its Capability for Constraining the EoR"
- 12) ... Talk, Physics Colloquium, University of Miami, Miami, USA, January 2015,
"Characterizing Cosmic Dawn through Observations of the 21-cm line"
- 11) ... Talk, Astrophysics Seminar, Florida State University, Tallahassee, USA, January 2015,
"Characterizing Cosmic Dawn through Observations of the 21-cm line"
- 10) ... Talk, Astronomy Seminar, University of Concepcion, Concepcion, Chile, January 2015,
"Characterizing Cosmic Dawn through Observations of the 21-cm line"
- 9) ... Talk, Engineering Seminar, UC de la Santisima Concepcion, Concepcion, Chile, January 2015,
"Characterizing Cosmic Dawn through Observations of the 21-cm line"
- 8) ... Invited Talk, Chilean Astronomy Web, UNAB, Santiago, Chile, December 2014,
"Characterizing the Cosmic Dawn through Observations of the 21-cm line"
- 7) ... Talk, Early Science with Low-Frequency Radio Telescopes, ASU, Tempe, USA, December 2014,
"Overview and Status of the EDGES Experiment"
- 6) ... Talk, URSI Conference, University of Colorado, Boulder, USA, January 2014,
"Global 21-cm-line Measurements with the EDGES Telescope"
- 5) ... Poster, NASA Lunar Science Virtual Forum, USA, July 2013,
"Advances on the Calibration of a Differential Front-End for the Dark Ages Radio Explorer (DARE)"
- 4) ... Talk, First AIUC Workshop, MRE, Santiago, Chile, November 2012,
"Opportunities and Challenges of Low Frequency Cosmology"

- 3) ... Talk, AAS 219th Conference, Austin, USA, January 2012,
“*Measuring the CMB Polarization at 95 GHz with the QUIET Experiment*”
- 2) ... Talk, AAS 216th Conference, Miami, USA, May 2010,
“*Impact of the Q/U Imaging Experiment on CMB Polarization Science*”
- 1) ... Talk, Miami Physics Conference, Ft. Lauderdale, USA, December 2009,
“*CMB Studies with the QUIET Radiotelescope*”

Journal papers:

- 18) ... T. J. Mozdzen, N. Mahesh, **R. A. Monsalve**, A. E. E. Rogers, J. D. Bowman,
Monthly Notices of the Royal Astronomical Society, Submitted, 2018
“*Spectral Index of the Diffuse Radio Background Between 50 and 100 MHz*”
- 17) ... **Raul A. Monsalve**, Anastasia Fialkov, Judd D. Bowman, Alan E. E. Rogers, Thomas J. Mozdzen, Aviad Cohen,
Rennan Barkana, Nivedita Mahesh,
The Astrophysical Journal, Submitted, 2018,
“*Results from EDGES High-Band: III. New Constraints on Parameters of the Early Universe*”
- 16) ... A. Ewall-Wice, T.-C. Chang, J. Lazio, O. Dore, M. Seiffert, **R. A. Monsalve**,
The Astrophysical Journal, Accepted, 2018, arXiv: 1803.01815v3
“*Modeling the Radio Background from the First Black Holes at Cosmic Dawn: Implications for the 21cm Absorption Amplitude*”
- 15) ... **Raul A. Monsalve**, Bradley Greig, Judd D. Bowman, Andrei Mesinger, Alan E. E. Rogers, Thomas J. Mozdzen,
Nicholas S. Kern, Nivedita Mahesh,
The Astrophysical Journal, 863, 11, August 2018,
“*Results from EDGES High-band. II. Constraints on Parameters of Early Galaxies*”
- 14) ... Bowman, J. D., Rogers, A. E. E., **Monsalve, R. A.**, Mozdzen, T. J., Mahesh, N.
Nature, 555, 67–70, March 2018,
“*An absorption profile centred at 78 megahertz in the sky-averaged spectrum*”
- 13) ... J. Singal, J. Haider, M. Ajello, D. R. Ballantyne, E. Bunn, J. Condon, J. Dowell, D. Fixsen, N. Fornengo, B. Harms,
G. Holder, E. Jones, K. Kellermann, A. Kogut, T. Linden, **R. Monsalve**, P. Mertsch, E. Murphy, E. Orlando, M.
Regis, D. Scott, T. Vernstrom, L. Xu
Publications of the Astronomical Society of the Pacific, 130:036001, March 2018,
“*The Radio Synchrotron Background: Conference Summary and Report*”
- 12) ... **Raul A. Monsalve**, Alan E. E. Rogers, Judd D. Bowman, Thomas J. Mozdzen,
The Astrophysical Journal, 847, 64, September 2017,
“*Results from EDGES High-Band: I. Constraints on Phenomenological Models for the Global 21 cm Signal*”
- 11) ... Jack O. Burns, Richard Bradley, Keith Tauscher, Steven Furlanetto, Jordan Mirocha, **Raul Monsalve**, David
Rapetti, William Purcell, David Newell, David Draper, Robert MacDowall, Judd Bowman, Bang Nhan,
Edward J. Wollack, Anastasia Fialkov, Dayton Jones, Justin C. Kasper, Abraham Loeb, Abhirup Datta,
Jonathan Pritchard, Eric Switzer, Michael Bica,
The Astrophysical Journal, 844, 33, July 2017,
“*A Space-Based Observational Strategy for Characterizing the First Stars and Galaxies Using the Redshifted 21-cm Global Spectrum*”
- 10) ... **Raul A. Monsalve**, Alan E. E. Rogers, Judd D. Bowman, Thomas J. Mozdzen,
The Astrophysical Journal, 835, 49, January 2017,
“*Calibration of the EDGES High-Band Receiver to Observe the Global 21-cm Signature from the Epoch of Reionization*”

- 9) ... T. J. Mozdzen, J. D. Bowman, **R. A. Monsalve**, and A. E. E. Rogers,
Monthly Notices of the Royal Astronomical Society, 464, 4, February 2017,
“Improved Measurement of the Spectral Index of the Diffuse Radio Background Between 90 and 190 MHz”
- 8) ... **Raul A. Monsalve**, Alan E. E. Rogers, Thomas J. Mozdzen, Judd D. Bowman,
IEEE Transactions on Microwave Theory and Techniques, 64, 8, August 2016
“One-Port Direct/Reverse Method for Characterizing VNA Calibration Standards”
- 7) ... T. J. Mozdzen, J. D. Bowman, **R. A. Monsalve**, and A. E. E. Rogers,
Monthly Notices of the Royal Astronomical Society, 455, 4, February 2016,
“Limits on Foreground Subtraction from Chromatic Beam Effects in Global Redshifted 21 cm Measurements”
- 6) ... QUIET Collaboration: T. M. Ruud, U. Fuskeland, I. K. Wehus, M. Vidal, D. Araujo, C. Bischoff, I. Buder, Y. Chinone, K. Cleary, R. N. Dumoulin, A. Kusaka, **R. Monsalve**, S. K. Naess, L. B. Newburgh, R. A. Reeves, J. T. L. Zwart, L. Bronfman, R. D. Davies, R. Davis, C. Dickinson, H. K. Eriksen, T. Gaier, J. O. Gundersen, M. Hasegawa, M. Hazumi, K. M. Huffenberger, M. E. Jones, C. R. Lawrence, E. M. Leitch, M. Limon, A. D. Miller, T. J. Pearson, L. Piccirillo, S. J. E. Radford, A. C. S. Readhead, D. Samtleben, M. Seiffert, M. C. Shepherd, S. T. Staggs, O. Tajima, K. L. Thompson,
The Astrophysical Journal, 811, 89, August 2015,
“The Q/U Imaging Experiment: Polarization Measurements of the Galactic Plane at 43 and 95 GHz”
- 5) ... QUIET Collaboration: K. M. Huffenberger, D. Araujo, C. Bischoff, I. Buder, Y. Chinone, K. Cleary, A. Kusaka, **R. Monsalve**, S. K. Naess, L. B. Newburgh, R. Reeves, T. M. Ruud, I. K. Wehus, J. T. L. Zwart, C. Dickinson, H. K. Eriksen, T. Gaier, J. O. Gundersen, M. Hasegawa, M. Hazumi, A. D. Miller, S. J. E. Radford, A. C. S. Readhead, S. T. Staggs, O. Tajima, K. L. Thompson,
The Astrophysical Journal, 806, 1, June 2015,
“The Q/U Imaging Experiment: Polarization Measurements of Radio Sources at 43 and 95 GHz”
- 4) ... A. E. E. Rogers, J. D. Bowman, J. Vierinen, **R. Monsalve**, T. Mozdzen,
Radio Science, 50, 2, February 2015,
“Radiometric Measurements of Electron Temperature and Opacity of Ionospheric Perturbations”
- 3) ... QUIET Collaboration: C. Bischoff, A. Brizius, I. Buder, Y. Chinone, K. Cleary, R. N. Dumoulin, A. Kusaka, **R. Monsalve**, S. K. Naess, L. B. Newburgh, G. Nixon, R. Reeves, K. M. Smith, K. Vanderlinde, I. K. Wehus, M. Bogdan, R. Bustos, S. E. Church, R. Davis, C. Dickinson, H. K. Eriksen, T. Gaier, J. O. Gundersen, M. Hasegawa, M. Hazumi, C. Holler, K. M. Huffenberger, W. A. Imbriale, K. Ishidoshiro, M. E. Jones, P. Kangaslahti, D. J. Kapner, C. R. Lawrence, E. M. Leitch, M. Limon, J. J. McMahon, A. D. Miller, M. Nagai, H. Nguyen, T. J. Pearson, L. Piccirillo, S. J. E. Radford, A. C. S. Readhead, J. L. Richards, D. Samtleben, M. Seiffert, M. C. Shepherd, S. T. Staggs, O. Tajima, K. L. Thompson, R. Williamson, B. Winstein, E. J. Wollack, J. T. L. Zwart,
The Astrophysical Journal, 768, 9, April 2013,
“The Q/U Imaging Experiment Instrument”
- 2) ... QUIET Collaboration: D. Araujo, C. Bischoff, A. Brizius, I. Buder, Y. Chinone, K. Cleary, R. N. Dumoulin, A. Kusaka, **R. Monsalve**, S. K. Naess, L. B. Newburgh, R. Reeves, I. K. Wehus, J. T. L. Zwart, L. Bronfman, R. Bustos, S. E. Church, C. Dickinson, H. K. Eriksen, T. Gaier, J. O. Gundersen, M. Hasegawa, M. Hazumi, K. M. Huffenberger, K. Ishidoshiro, M. E. Jones, P. Kangaslahti, D. J. Kapner, D. Kubik, C. R. Lawrence, M. Limon, J. J. McMahon, A. D. Miller, M. Nagai, H. Nguyen, G. Nixon, T. J. Pearson, L. Piccirillo, S. J. E. Radford, A. C. S. Readhead, J. L. Richards, D. Samtleben, M. Seiffert, M. C. Shepherd, K. M. Smith, S. T. Staggs, O. Tajima, K. L. Thompson, K. Vanderlinde, R. Williamson,
The Astrophysical Journal, 760, 145, November 2012,
“Second Season QUIET Observations: Measurements of the CMB Polarization Power Spectrum at 95 GHz”
- 1) ... QUIET Collaboration: Bischoff, C., Brizius, A., Buder, I., Chinone, Y., Cleary, K., Dumoulin, R. N., Kusaka, A., **Monsalve, R.**, Naess, S. K., Newburgh, L. B., Reeves, R., Smith, K. M., Wehus, I. K., Zuntz, J. A.,

Zwart, J. T. L., Bronfman, L., Bustos, R., Church, S. E., Dickinson, C., Eriksen, H. K., Ferreira, P. G., Gaier, T., Gundersen, J. O., Hasegawa, M., Hazumi, M., Huffenberger, K. M., Jones, M. E., Kanglaslahti, P., Kapner, D. J., Lawrence, C. R., Limon, M., May, J., McMahon, J. J., Miller, A. D., Nguyen, H., Nixon, G. W., Pearson, T. J., Piccirillo, L., Radford, S. J. E., Readhead, A. C. S., Richards, J. L., Samtleben, D., Seiffert, M., Shepherd, M. C., Staggs, S. T., Tajima, O., Thompson, K. L., Vanderlinde, K., Williamson, R., & Winstein, B., **The Astrophysical Journal**, 741, 111, October 2011,
“First Season QUIET Observations: Measurements of CMB Polarization Power Spectra at 43 GHz in the Multipole Range $25 \leq l \leq 475$ ”

Conference papers:

- 1) ... **Raul A. Monsalve**,
Proc. SPIE 7741, San Diego, June 2010,
“Beam characterization for the QUIET Q-Band instrument using polarized and unpolarized astronomical sources”

Memos:

Available on Haystack EDGES Memo Series webpage:

http://www.haystack.mit.edu/ast/arrays/Edges/EDGES_memos/EdgesMemo.html

- 2014/07/31, *“Characterization of RFI at the UNR Gund Ranch”*
- 2013/09/05, *“Effect of Error in the VNA Calibration Standards, on Measured Reflection Coefficient”*
- 2013/05/03, *“Sensitivity of EDGES Antenna Prototype to Different Perturbations”*
- 2012/12/13, *“Stability measurements of VNA, coaxial cable, and antenna with Roberts balun”*

Available on ASU Low-Frequency Cosmology Lab Memo webpage:

<http://loco.lab.asu.edu/memos/>

- 2018/04/12, *“First Tests of Absorption Feature Below 90 MHz in EDGES High-Band Data with Blade Antenna”*
- 2018/01/26, *“Constraints on Physical Parameters of 21-cm Models from Cohen/Fialkov/Barkana: Part 2”*
- 2018/01/24, *“Constraints on Physical Parameters of 21-cm Models from Cohen/Fialkov/Barkana”*
- 2017/09/27, *“Constraining Emission Feature in the Range 85-115 MHz with MCMC”*
- 2017/09/25, *“Revisiting the Signature Extraction from Low-Band 1 Data using MCMC”*
- 2017/09/24, *“Fit Configurations for EoR Constraints in Monsalve et al. (2017)”*
- 2017/08/31, *“Summary of Data Analysis: Low-Band 2, East-West Antenna, with NO Balun Shield”*
- 2017/08/31, *“Summary of Data Analysis: Low-Band 2, East-West Antenna, with Balun Shield”*
- 2017/08/31, *“Summary of Data Analysis: Low-Band 2, North-South Antenna”*
- 2017/08/31, *“Summary of Data Analysis: Low-Band 1, Extended Ground Plane”*
- 2017/08/24, *“Summary of Data Analysis: Low-Band 1, Original Ground Plane”*
- 2017/08/16, *“Airline Measurements at the Input of the Low-Band 1 Receiver”*
- 2017/08/16, *“Reflection Coefficient of Internal Calibration Standards”*
- 2017/08/16, *“Comparison of Methods for Reflection Calibration at the Receiver Input”*
- 2017/08/01, *“Verification of 2015 and 2017 Parameters of the Low-Band 1 Front-End Network”*
- 2017/08/14, *“Cross-check between Calibrations of Two Benchtop Keysight/Agilent VNAs”*
- 2017/07/27, *“New Test Calibration of a Subset of Low-Band 1 Data”*
- 2017/06/15, *“Summary of Low-Band Residuals”*
- 2017/06/14, *“21-cm Parameter Estimation using Markov Chain Monte Carlo”*
- 2017/05/29, *“Nominal Calibration Data and Results for the Low Band 1 and 2 Receivers at 25degC”*
- 2017/05/27, *“S-parameters of the Front-end Network in the Low-Band 1 Receiver”*
- 2017/05/11, *“Progress in the Rejection of Physical Global 21 cm Models”*
- 2017/04/19, *“Lowband-2 Calibration Summary 2016”*
- 2017/03/05, *“Estimation of the Reflection Magnitude Accuracy with the Agilent E5061A VNA: Part 2”*
- 2017/03/05, *“Initial Calibration Results for Second EDGES Low-Band Receiver”*
- 2017/02/27, *“Estimation of the Reflection Magnitude Accuracy with the Agilent E5061A VNA at -30 dBm”*

2017/02/16, "Rejection of Tanh Models for the Global 21-cm Signal: PART 4, χ^2 Sliding Window Approach (ongoing work)"

2017/02/07, "Rejection of Tanh Models for the Global 21-cm Signal from Simulated Data: PART3 Sliding Window Approach"

2017/02/01, "Rejection of Tanh Models for the Global 21-cm Signal from Simulated Data: PART2"

2017/01/31, "Rejection of Tanh Models for the Global 21-cm Signal from Simulated Data (ongoing work)"

2016/12/13, "Preliminary Rejection of Gaussian Models for the Global 21-cm with EDGES High-Band (ongoing work)"

2016/11/23, "Preliminary Rejection of Global 21-cm Models with EDGES High-Band (ongoing work)"

2016/11/17, "EDGES High-Band Average Spectrum (ongoing work)"

2016/09/02, "Measurements of Low- and High-band Antenna S11 at the MRO on August 30-31, 2016"

2016/04/20, "Spectral Index Comparisons Between GSM and EDGES High-Band Measurements"

2016/07/20, "Estimating the Accuracy of the Antenna S11 Measurements at the MRO"

2016/03/16, "Estimates for the Sky Polarization Intensity at ~150 MHz averaged over Wide Solid Angles"

2015/12/10, "Reflection Coefficient Measurements of the EDGES Low-Band BLADE Antenna Starting on 2015/12/08"

2015/09/26, "Pictures of the Low-band Receiver Assembly"

2015/09/25, "Stability of the Antenna Reflection Coefficient Measurements at the MRO"

2015/09/22, "Reflection Coefficient Measurements of the EDGES High-Band BLADE Antenna Starting on 2015/09/19"

2015/08/04, "Reflection Coefficient Measurements of the EDGES High-Band BLADE Antenna Starting on 2015/07/31"

2015/06/11, "Reflection Coefficient Measurements of the EDGES High-Band Fourpoint Antenna Starting on 2015/06/06"

2015/06/04, "Comparison of Alternatives for Calibration of the High-Band Receiver 2015 at 25oC"

2015/05/13, "Antenna S11 Measurements at MRO, April/May 2015"

2015/03/05, "Summary of Antenna S11 Measurements at MRO Starting on 2015/02/27"

2015/02/19, "Progress Toward a Full Uncertainty Propagation Machinery for EDGES: II"

2015/02/12, "Progress Toward a Full Uncertainty Propagation Machinery for EDGES"

2014/12/11, "Testing the Temperature Controller on 2014/12/11"

2014/12/08, "EDGES - Temperature Control Circuit"

2014/12/08, "Testing the Temperature Controller on 2014/12/08"

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- 2013/08/01, *“Sensitivity of Antenna to Different Perturbations”*
- 2013/07/26, *“Heating and Cooling Test”*
- 2013/07/21, *“VNA Accuracy Test 2”*
- 2013/07/18, *“VNA Accuracy Test”*
- 2013/07/13, *“Revisiting the Calibration Method”*
- 2013/07/11, *“Measurement of Antenna (Aluminum Base)”*
- 2013/06/20, *“Quick Look at Changes in Antenna Reflection Coefficient When Applying Heat with Heat Guns”*
- 2013/05/22, *“Measurement of Antenna using Air-dielectric Adapters and No Teflon in Tuner”*
- 2013/05/14, *“First Measurement of Antenna using Mechanical Switch”*
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