Alma ROUX HODZIC

Contact information

5237 Retreat Circle, Longmont, CO 80503
Phone: 303-907-5523
Email: alma@ucar.edu

Education

2018	HDR	Habilitation to direct research, University Paul Sabatier, Toulouse, France
2015	Tenure	National Center for Atmospheric Research (NCAR), Boulder, Colorado
2005	Ph.D.	Atmospheric Science (Summa cum laude), Ecole Polytechnique, France
2002	M.Sc.	Meteorology and Meteorological Engineering (Honors), National School of Meteorology (French engineering schools), Toulouse, France
1997		Baccalaureate in Science, France

Current Position and Roles

Scientist III (Ladder Track)
October 2015 – Present
NCAR, Atmospheric Chemistry Observations and Modeling, Boulder, CO

Highly accomplished atmospheric scientist focusing on aerosol chemistry and microphysics, aerosol/cloud interactions, multi-scale modeling from aerosol processes to climate applications, and aerosol modeling and measurement infrastructure/platforms. Dr. Hodzic is/has:

- Currently co-leading the Operations & Maintenance proposal to NSF to start operating the long-term aerosol ground network known as ASCENT (Atmospheric Science and Chemistry mEasurement NeTwork) at NCAR end of 2024.
- Led and conducted comprehensive urban, regional and climate modeling studies on the formation, evolution and removal of carbonaceous aerosols, and their feedbacks with vegetation, weather, and climate.
- Contributed to the development and evaluation of aerosol mechanisms within chemistry-climate models, using field campaign measurements, routine network measurements, satellite data and benchmark explicit models.
- Led research projects with a diverse team of atmospheric and data scientists and students exploring the integration of Machine Learning techniques to improve representation of chemistry/aerosols in Earth system models.
- Contributed in the development, evaluation, and application of community models, including GECKO-A, WRF-Chem, GEOS-Chem, CESM-Chem, MUSICA, and the GIANT community project.
- Utilized remote sensing data to investigate impact of wildfire on local weather patterns during extreme events.
- Participated in several field campaign deployments through operations forecasting and data analysis (e.g., MILAGRO, BEACHON, SOAS, ATOM).

- Co-organized Summer Schools, Workshops, and Hackathons as well as sessions on aerosol chemistry and physics at international conferences.
- Supervised graduate students, postdocs, undergraduate visitors, and software engineers.
- Wrote and managed several successful proposals with the U.S. and European agencies.
- Authored and co-authored more than 80 peer-reviewed scientific publications.

Previous Professional Experience

2017 - 2018	Scientist	Sabbatical at the National Center for Scientific Research, Laboratory of aerology (Laero), Toulouse, France
2010 - 2015	Scientist II	Atmospheric Chemistry Division, NCAR, Boulder, CO
2007 - 2010	Scientist I	Atmospheric Chemistry Division, NCAR, Boulder, CO
2005 - 2007	Post-doc	Advanced Study Program (ASP), NCAR, Boulder, CO
2002 - 2005	Ph.D.	Laboratory of Dynamic Meteorology, Paris, France

Synergistic Activities and Honors

- 2023- now Chief Scientist for the ASCENT network (transfer to NCAR in 2024)
- 2023- now Member of the NCAR Assimilation, Infrastructure, and Modeling (AIM) working group
- 2021- now Co-lead of the GIANT (GeneralIzed Aerosol/chemistry iNTerface) community modeling effort
- 2021 Recipient of the Machine Learning NCAR award
- 2019 - now Co-chair of the MUSICA-aerosols working group
- 2019 Invited lecturer on aerosol chemistry at the Univ. of Phayao, Thailand.
- 2018 Recipient of the European Research Center (ERC) consolidator grant
- 2016-2021 Co-Editor of the Atmospheric Chemistry and Physics journal
- 2015-now Ph.D. jury / committee member for 8 students
- 2013-2017 NCAR Scientists' Assembly Executive committee co-chair
- 2013-now Active member in proposal panels (NASA, DOE, EMSL, Swiss National Science Foundation, NSF).

Committees and Panels

1. NSF SOARS (Significant Opportunities in Atmospheric Research and Science) selection committee member and mentor since 2021. SOARS is an undergraduate-to-graduate bridge program designed to broaden participation of historically underrepresented communities in the atmospheric and related sciences.
2. Department of Energy (DOE)
   - Early Career Panel (2018)
   - EMSL Panel (2015-2017)
3. National Aeronautics and Space Administration (NASA)
   - Earth Venture Suborbital-4 (EVS-4) Panel (2023)
   - ACMAP and Panel (2017, 2013)

- AIST-21 Panel (2021)
- Postdoctoral Panel (2014)

4. National Center for Atmospheric Research (NCAR)
   - Co-organizer of the ASP Colloquium (07/2023)
   - Co-Chair, NCAR Scientists' Assembly Executive Committee (2015-2017)
   - CISL High-Performance Computing Panel (2014-2022)
   - NCAR Awards Committee (2013-2017)
   - Early Career Scientist Assembly Chair for the NCAR Strategic Plan (2012)

Skills

- Atmospheric physics and chemistry
- Computational modeling and simulations
- Effective communication of results through scientific presentations and publications
- Research proposal writing and project management
- Leadership in managing mid-size community projects and teams
- Engaged with funding agencies and program managers
- Successful supervision of postdoctoral fellows, graduate students, and software engineers
- Committee coordination and leadership
- Occasional teaching at summer schools and colloquiums
- Skilled in organizing scientific meetings and sessions at international conferences
- Skilled in reviewing and evaluating research proposals.

Publications

1. **Hodzic A.,** Chepfer H., Vautard R., et al., 2004. Comparison of aerosol chemistry-transport model simulations with lidar and sun-photometer observations at a site near Paris, *J. Geophys. Res.,* **109**.
2. Bessagnet B, **Hodzic A,** Vautard R, et al., 2004. Aerosol modeling with CHIMERE - preliminary evaluation at the continental scale, *Atmos. Environ.,* **38** (18), 2803-2817.
3. **Hodzic A.,** Vautard R., Bessagnet B., Lattuati M., Moreto F., 2005. Long-term urban aerosol simulation versus routine particulate matter observations, *Atmos. Environ.,* **39**, 5851-5864.
4. Bessagnet B., **Hodzic A.**, Blanchard O., et al., 2005. Origin of particulate matter pollution episodes in wintertime over the Paris Basin, *Atmos. Environ.,* **39**, 6159-6175.
5. Haeffelin M, Barthes L, Bock O, Boitel C, Bony S, Bouniol D, Chepfer H, Chiriaco M, Cuesta J, Delanoe J, Drobinski P, Dufresne JL, Flamant C, Grall M, **Hodzic A,** Hourdin F, Lapouge R, Lemaitre Y, Mathieu A, Morille Y, Naud C, Noel V, O'Hirok W, Pelon J, Pietras C, Protat A, Romand B, Scialom G, Vautard R, 2005. SIRTA, a ground-based atmospheric observatory for cloud and aerosol research, *Annales Geophysicae*, **23** (2), 253-275.
6. **Hodzic A.,** Vautard R., Chazette P., Menut L., Bessagnet B., 2006. Aerosol chemical and optical properties over the Paris area within ESQUIF project, *Atmos. Chem. Phys*., **6**, 3257-3280.

7. **Hodzic A.,** Vautard R., et al., 2006. Evolution of aerosol optical thickness over Europe during the August 2003 heat wave as seen from POLDER data and CHIMERE model simulations, *Atmos. Chem. Phys*., **6**.

8. **Hodzic A.,** Bessagnet B., Vautard R., 2006. A model evaluation of coarse-mode nitrate heterogeneous formation on dust particles, *Atmos. Environ.,* **40** (22), 4158-4171.

9. Cuvelier C, Thunis P, Vautard R, Amann M, Bessagnet B, Bedogni M, Berkowicz R, Brandt J, Brocheton F, Builtjes P, Carnavale C, Coppalle A, Denby B, Douros J, Graf A, Hellmuth O, **Hodzic A,** Honore C, et al., 2007. CityDelta: A model intercomparison study to explore the impact of emission reductions in European cities in 2010, *Atmos. Environ.,* **41** (1), 189-207.

10. Salameh T, Drobinski P, Menut L, Bessagnet B, Flamant C, **Hodzic A,** Vautard R., 2007. Aerosol distribution over the western Mediterranean basin during a Tramontane/Mistral event, *Annales Geophysicae*, **25** (11), 2271-2291.

11. Vautard R., Beekmann M., Desplat J., **Hodzic A.,** Morel S., 2007. Air quality in Europe during the summer of 2003 as a prototype of air quality in a warmer climate, *Comptes Rendus Geoscience*, **339**, 11-12.

12. **Hodzic A,** Madronich S, Bohn B, et al., 2007. Wildfire particulate matter in Europe during summer 2003: meso-scale modeling of smoke emissions, transport and radiative effects, *Atmos. Chem. Phys.,* **7** (15), 4043-4064.

13. Bessagnet B., Menut L., Curci G., **Hodzic A.,** et al., 2008. Regional modeling of carbonaceous aerosol over Europe - Focus on Secondary Organic Aerosols, *J. of Atmos. Chem.*, **61**, 175-202.

14. Stern R, Builtjes P, Schaap M, Timmermans R, Vautard R, **Hodzic A**, Memmesheimer M, et al., 2008. A model inter-comparison study focusing on episodes with elevated PM10 concentrations, *Atmos. Environ.,* **42** (19), 4567-4588.

15. Fast J.D. A. C. Aiken, J. Allan, L. Alexander, T. Campos, M. R. Canagaratna, E. Chapman, P. F. DeCarlo, B. de Foy, J. Gaffney, J. de Gouw, J. C. Doran, L. Emmons, **A. Hodzic**, S. C. Herndon, et al., 2009. Evaluating simulated primary anthropogenic and biomass burning organic aerosols during MILAGRO: implications for assessing treatments of secondary organic aerosols, *Atmos. Chem. Phys.,* **9**, 6191-6215.

16. **Hodzic A.,** Jimenez JL., Madronich S., et al., 2009. Modeling organic aerosols during MILAGRO: importance of biogenic secondary organic aerosols, *Atmos. Chem. Phys.,* **9**, 6949-6981.

17. Karl T., Apel E., **Hodzic A.,** et al., 2009. Emissions of volatile organic compounds inferred from airborne flux measurements over a megacity, *Atmos. Chem. Phys.,* **9**, 271-285.

18. **Hodzic A.,** Jimenez J.L., Prevot A.S.H., Szidat. S., Fast J.D., Madronich S., 2010. Can 3D Models Explain the Observed Fractions of Fossil and non-Fossil Carbon In and Near Mexico City? *Atmos. Chem. Phys.,* **10**, 10997-11016, doi:10.5194/acp-10-10997-2010.

19. **Hodzic, A.,** J. L. Jimenez, S. Madronich, M. R. Canagaratna, P. F. DeCarlo, L. Kleinman, and J. Fast, 2010. Modeling organic aerosols in a megacity: potential contribution of semi-volatile and intermediate volatility primary organic compounds to secondary organic aerosol formation, *Atmos. Chem. Phys.,* **10**, 5491-5514.

20. **Hodzic A.** and Jimenez, J. L., 2011. Modeling anthropogenically controlled secondary organic aerosols in a megacity: a simplified framework for global and climate models, *Geosci. Model. Dev.,* **4**, 901-917, doi:10.5194/gmd-4-901-2011.

21. Lee-Taylor J., S. Madronich, B. Aumont, M. Camredon, **A. Hodzic**, G. S. Tyndall, E. Apel, and R. A. Zaveri, 2011. Explicit modeling of organic chemistry and secondary organic aerosol partitioning for Mexico City and its outflow plume, *Atmos. Chem. Phys.,* **11**, 13219-13241.

22. Shrivastava M., Fast J., Easter R., Gustafson W.I., Zaveri R.A., Jimenez J.L., Saide P., and **Hodzic A.,** 2011. Modeling Organic Aerosols in a Megacity: Comparison of Simple and Complex Representations of the Volatility Basis Set Approach. *Atmos. Chem. Phys.,* **11**, 6639-6662.

23. **Hodzic A.,** Wiedinmyer C., Salcedo D., Jimenez J.L., 2012. Impact of Trash Burning on Air Quality in Mexico City, *Environ. Sci. Technol.,* doi: 10.1021/es203954r.

24. Barth, M. C., Lee, J., **Hodzic, A.,** Pfister, G., Skamarock, W. C., Worden, J., Wong, J., and Noone, D., 2012. Thunderstorms and upper troposphere chemistry during the early stages of the 2006 North American Monsoon, *Atmos. Chem. Phys.,* **12**, 11003-11026, doi:10.5194/acp-12-11003-2012.

25. **Hodzic A.,** Madronich S., Aumont B., Lee-Taylor J., Karl T., Camredon M. and Mouchel-Vallon C., 2013. Limited influence of dry deposition of semi-volatile organic vapors on secondary organic aerosol formation in the urban plume, *Geophys. Res. Lett.,* **40**, 3302–3307, doi:10.1002/grl.50611.

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anthropogenic pollution during BEACHON-RoMBAS 2011, *Atmos. Chem. Phys.,* **14**, 11011-11029.

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32. Tsigaridis, K., Daskalakis, N., Kanakidou, M., Adams, P. J., Artaxo, P., Bahadur, R., Balkanski, Y., Bauer, S. E., Bellouin, N., Benedetti, A., Bergman, T., Berntsen, T. K., Beukes, J. P., Bian, H., Carslaw, K. S., Chin, M., Curci, G., Diehl, T., Easter, R. C., Ghan, S. J., Gong, S. L., **Hodzic, A.,** Hoyle, C. R., Iversen, T., Jathar, S., Jimenez, J. L., Kaiser, J. W., Kirkevåg, A., Koch, D., Kokkola, H., Lee, Y. H., Lin, G., Liu, X., Luo, G., Ma, X., Mann, G. W., Mihalopoulos, N., Morcrette, J.-J., Müller, J.-F., Myhre, G., Myriokefalitakis, S., Ng, S., O'Donnell, D., Penner, J. E., Pozzoli, L., Pringle, K. J., Russell, L. M., Schulz, M., Sciare, J., Seland, Ø., Shindell, D. T., Sillman, S., Skeie, R. B., Spracklen, D., Stavrakou, T., Steenrod, S. D., Takemura, T., Tiitta, P., Tilmes, S., Tost, H., van Noije, T., van Zyl, P. G., von Salzen, K., Yu, F., Wang, Z., Wang, Z., Zaveri, R. A., Zhang, H., Zhang, K., Zhang, Q., and Zhang, X., 2014. The AeroCom evaluation and intercomparison of organic aerosol in global models, *Atmos. Chem. Phys.,* **14**, 10845-10895, doi:10.5194/acp-14-10845-2014.

33. Yatavelli R.L.N., Stark H., Thompson S.L., Kimmel J.R., Cubison M.J., Day D.A., Campuzano-Jost P., Palm B.B., **Hodzic A.,** Thornton J.A., Jayne J.T, Worsnop D.R., and Jimenez J.L., 2014. Semicontinuous measurements of gas–particle partitioning of organic acids in a ponderosa pine forest using a MOVI-HRToF-CIMS, *Atmos. Chem. Phys.,* **14**, 1527-1546.

34. Fast, J. D., Allan, J., Bahreini, R., Craven, J., Emmons, L., Ferrare, R., Hayes, P. L., **Hodzic, A.,** Holloway, J., Hostetler, C., Jimenez, J. L., Jonsson, H., Liu, S., Liu, Y., Metcalf, A., Middlebrook, A., Nowak, J., Pekour, M., Perring, A., Russell, L., Sedlacek, A., Seinfeld, J., Setyan, A., Shilling, J., Shrivastava, M., Springston, S., Song, C., Subramanian, R., Taylor, J. W., Vinoj, V., Yang, Q., Zaveri, R. A., and Zhang, Q., 2014. Modeling regional aerosol variability over California and its sensitivity to emissions and long-range transport during the 2010 CalNex and CARES campaigns, *Atmos. Chem. Phys.,* **14**, 10013-10060, doi:10.5194/acp-14-10013-2014.

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36. Knote, C., **Hodzic, A.,** and Jimenez, J. L., 2015. The effect of dry and wet deposition of condensable vapors on secondary organic aerosols concentrations over the continental US, *Atmos. Chem. Phys.,* 15, 1-18.

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<u>Externally funded proposals</u>

- Principal Investigator (PI), DOE Project (2011-2014) – Evaluation of Aerosol Processes using field campaign measurements.
- PI, NASA ACMAP Proposal (2015-2018) - Using satellite data to constrain cloud radiative effects on photochemistry in air quality models.
- Co-PI, DOE Proposal (2017-2020) - Modeling of the explicit chemistry of organic aerosols: Formation, removal, and comparison with observations.
- PI, EPA Proposal (2017-2020) - Rethinking the formation of secondary organic aerosols (SOA) under changing climate by incorporating mechanistic and field constraints.
- PI, ERC Consolidator Grant (2018-2023) - Physico-Chemistry of Carbonaceous Aerosol Pollution in Evolving Cities - CARB-City.
- Co-PI, NSF Proposal (2021-2024) - Reframing Modeling Approaches for Multiphase Chemistry: Isoprene and Beyond.
- Chief Scientist, NSF O&M Proposal (2024-2034) - Atmospheric Science and Chemistry mEasurement NeTwork (ASCENT) – in prep.