

Thibaut DAUHUT

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Research experience

- 2017 - 2018 Post-doc on the combined effect of mixing and microphysical processes in the **Tropical Tropopause Layer** with Peter Haynes, Jean-Pierre Chaboureau and Yves Morel.
- 2013 - 2016 **PhD** at the *Laboratoire d'Aérodynamique* (CNRS and University of Toulouse) on **Hector the Convecteur**, the epitome of the thunderstorm that hydrates the stratosphere. Analysis of **Giga-LES**.
- Characterisation of the transition between the deep and the **very deep convection**.
 - Development of a **parallel algorithm** that allows the identification and characterisation of the **updrafts**.
 - Sensitivity study of the convection properties to the spatial resolution of the model.
 - Analysis of the **dynamical and microphysical processes** leading to the stratosphere hydration.
- 2012 - 2013 Internship on the link between the generation of inertial currents in the Brazilian Current and the synoptic weather conditions, with Arcilan Assireu (UNIFEI, Itajubá, MG, Brazil).
- 2012 Internship on the atmospheric circulation led by convective heating in the frame of Madden-Julian Oscillation, with Jean-Philippe Duvel (LMD, ENS, Paris, France).
- 2011 Internship on the link between Rossby wave breakings and tropical cyclones genesis in North Australia, with Michael Reeder (Monash University, Melbourne, Australia).
- 2010 Internship on the **convection** in liquid films under thermal strain, with Hervé Caps (University of Liège, Belgium).

Peer-review publications

1. Marquet P. and Dauhut T.: Reply to the Comments of Olivier Pauluis to the paper "A Third-Law Isentropic Analysis of a Simulated Hurricane", *J. Atmos. Sci.*, 75, 3735–3747, 2018.
2. Lac, C., et co-auteurs: Overview of the Meso-NH model version 5.4 and its applications, *Geosci. Model Dev.*, 11, 1929-1969, 2018.
3. Dauhut T., Chaboureau J.-P., Mascart P., Pauluis O.: The atmospheric overturning induced by Hector the Convecteur, *J. Atmos. Sci.*, 74 (10), 3271-3284, 2017.
4. Assireu A., Dauhut T., dos Santos F., Lorenzetti J.: Near-inertial motions in the Brazil Current at 24°S-36°S: observations by satellite tracked drifters, *Cont. Shelf Res.*, 145, 1-12, 2017.
5. Dauhut T., Chaboureau J.-P., Escobar J., Mascart P.: Giga-LES of Hector the Convecteur and its two tallest updrafts up to the stratosphere, *J. Atmos. Sci.*, 73 (12), 5041-5060, 2016.
6. Chaboureau J.-P., Flamant C., Dauhut T., Kocha C., Lafore J.-P., Lavaysse C., Marnas F., Mokhtari M., Pelon J., Reinares Martínez I., Schepanski K., Tulet P.: Fennec dust forecast intercomparison over the Sahara in June 2011, *Atmos. Chem. Phys.*, 16, 6977–6995, 2016.
7. Dauhut T., Chaboureau J.-P., Escobar J., Mascart P.: Large-eddy simulations of Hector the convecteur making the stratosphere wetter, *Atmos. Sci. Lett.*, 16, 135-140, 2015.

8 presentations and 7 posters in international conferences. 9 invited seminars on *Hector the Convecteur*.

Education

- 2016 PhD degree in Ocean, Atmosphere and Climate Sciences at the University of Toulouse 3 (UPS).
- 2013 Diploma of the **Ecole Normale Supérieure of Cachan** (a top-ranking French higher education institution training teachers and researchers).
- 2012 Master's degree with honours in Atmospheric Sciences at University of Paris 6 (UPMC).
- 2010 Bachelor's degree with honours in Physics at the UPMC and at the ENS of Cachan.

Additional skills and experience

Teaching service of 64h at the Faculty of Physics of the University of Toulouse, bachelor and master level, 32h of lab work in Physics at Louis-Le-Grand highschool, Paris.

Fluently spoken languages: **French, English, Portuguese**. Intermediate level: **German**.

IT languages: Fortran, including MPI library. Software: Meso-NH, NCL, ParaView, MATLAB.

References: Jean-Pierre Chaboureau, PhD supervisor, jean-pierre.chaboureau@aero.obs-mip.fr
Peter H. Haynes, post-doc advisor, p.h.haynes@damtp.cam.ac.uk

Other communication than peer-review publications

Oral presentations in international conferences

1. Dauhut T., Chaboureau J.-P., Mascart P. and Lane T.: The mechanisms of the overshoots that hydrate the stratosphere. 17th AMS conference on mesoscale processes, San Diego, USA, 24-27 July 2017.
2. Dauhut T., Chaboureau J.-P., Escobar J. and Mascart P.: Giga-LES of Hector the Convecting keeping the tallest updrafts almost undiluted on their way to the stratosphere. Understanding Cloud and Precipitation, Berlin, Germany, 15-19 February 2016.
3. Dauhut T., Chaboureau J.-P., Escobar J. and Mascart P.: Giga-LES of Hector the Convecting keeping the tallest updrafts undiluted. 16th AMS conference on mesoscale processes, Boston, USA, 3-6 August 2015.
4. Dauhut T., Chaboureau J.-P., Escobar J., and Mascart P.: Giga-LES of Hector the Convecting keeping the tallest updrafts undiluted. Workshop on water budget in the TTL, Reims, France, 1-3 July 2015.
5. Chaboureau J.-P., Dauhut T., Escobar J. and Mascart P.: Giga-LES of Hector the Convecting Keeping the Tallest Updrafts Undiluted up to the Stratosphere. 26th IUGG General Assembly, Prague, Czech Republic, 22 June - 2 July 2015.
6. Chaboureau J.-P., Dauhut T., Escobar J. and Mascart P.: Giga-LES of Hector the Convecting making the Tropical Stratosphere wetter. AGU General Assembly, San Francisco, United-States, 15-19 Dec. 2014.
7. Dauhut T., Chaboureau J.-P., Escobar J. and Mascart P.: Large-Eddy Simulation of Hector the Convecting. MOZAIC – IAGOS Symposium, Toulouse, France, 12-16 May 2014.
8. Dauhut T., Chaboureau J.-P., Escobar J. and Mascart P.: Large-Eddy Simulation of Hector the Convecting. EGU General Assembly, Vienna, Austria, 22 April - 2 May 2014.

Posters in international conferences

1. Dauhut T., Chaboureau J.-P., Mascart P. and Lane T.: The overshoots that hydrate the stratosphere in the tropics. EGU General Assembly, Vienna, Austria, 8-13 April 2018.
2. Kuznetsova D., Dauhut T., and Chaboureau J.-P.: The inhibiting role of the congestus after the MJO passage over the Indian Ocean and the Maritime Continent. EGU General Assembly, Vienna, Austria, 8-13 April 2018.
3. Dauhut T., Chaboureau J.-P., Mascart P. and Pauluis O.: An isentropic perspective of the atmospheric overturning induced by Hector the Convecting. EGU General Assembly, Vienna, Austria, 24-28 April 2017. **Awarded as Outstanding Student Poster.**
4. Dauhut T., Chaboureau J.-P., Escobar J. and Mascart P.: Giga-LES of Hector the Convecting: How shallow convection over island developed into very deep convection up to the stratosphere. AGU General Assembly, San Francisco, California, USA, 12-16 Dec. 2016.
5. Chaboureau J.-P., Dauhut T., Escobar J. and Mascart P.: Giga-LES of Hector the Convecting Keeping the Tallest Updrafts Undiluted Up to the Stratosphere. StratoClim Annual Meeting, Budapest, Hungary, 24-28 Oct. 2015.
6. Dauhut T., Chaboureau J.-P., Escobar J. and Mascart P.: Giga-LES of Hector the Convecting Keeping Tallest Updrafts Undiluted. EGU General Assembly, Vienna, Austria, 13-17 April 2015.
7. Dauhut T., Chaboureau J.-P., Escobar J. and Mascart P.: Large-Eddy Simulation of Hector the Convecting making the stratosphere wetter. 7th International Scientific Conference on the Global Water and Energy Cycle, The Hague, The Netherlands, 14-18 July 2014.

Invited seminars

Hydration of the tropical stratosphere by very deep convection.

1. Laboratoire de Météorologie Dynamique, Paris, France, 27 Sept. 2018.

How does the very deep convection hydrate the stratosphere? Results from a Giga-LES of Hector the Convecting.

2. Dept of Applied Mathematics and Theoretical Physics, University of Cambridge, UK, 22 May 2018.
3. Max Planck Institut für Meteorologie, Hambourg, Germany, 20 Sept. 2017.

Giga-LES of Hector the Convecting keeping its tallest updrafts undiluted.

4. School of Earth, Atmosphere & Environment, Monash University, Melbourne, Australia, 16 Dec. 2015.
5. School of Earth Sciences, University of Melbourne, Australia, 3 Dec. 2015.
6. Bureau of Meteorology of Darwin, Australia, 25 Nov. 2015.

Giga-LES of Hector the Convecting, the epitome of the thunderstorm hydrating the stratosphere.

7. DAOS, McGill University, Montreal, Canada, 14 August 2015.
8. Goddard Institute for Space Studies, New York, USA, 30 July 2015.
9. Courant Institute, New York University, New York, USA, 20 July 2015.

Oral presentations in national workshop and conferences

1. Marquet P., Dauhut T.: Quelques aspects de l'énergétique de l'air humide pour le cyclone Dumilé et pour "Hector the Convecteur", Atmospheric Modélisation Workshops, Toulouse, France, 12-14 Feb. 2018.
2. Dauhut T., Chaboureau J.-P., Mascart P. and Lane, T.: Les percées nuageuses qui hydratent la stratosphère tropicale. Réunion du GDR "Megha-Tropiques", Avignon, France, 29 Nov.-1Dec. 2017.
3. Dauhut T., Chaboureau J.-P., Mascart P. and Lane, T.: Les mécanismes dans les percées nuageuses qui hydratent la stratosphère. Journées des Utilisateur de Méso-NH, Toulouse, 12-13 Oct. 2017.
4. Dauhut T., Chaboureau J.-P., Mascart P. and Pauluis O. : Transport irréversible jusqu'en stratosphère dans une LES de Hector the Convecteur. Atmospheric Modélisation Workshops, Toulouse, France, 30 Jan.-3 Feb. 2017.
5. Dauhut T., Chaboureau J.-P., Escobar J. and Mascart P.: Giga-LES of Hector the Convecteur and its two tallest updrafts up to the stratosphere. Visio-conférence pour le projet TRO-pico à Paris, France, 26 Sept. 2016.
6. Dauhut T., Chaboureau J.-P., Escobar J. and Mascart P.: Hector the Convecteur et ses deux geysers, intensément alimentés en surface, peu dilués en troposphère et jaillissant en stratosphère. Journées des Utilisateur de Méso-NH, Toulouse, 5-6 Nov. 2015.
7. Dauhut T., Chaboureau J.-P., Escobar J. and Mascart P.: Rôle de la convergence de basse couche et des courants de densité dans la genèse de la convection très profonde. Ateliers DEPHY 2, Toulouse, 2-3 Nov. 2015.
8. Dauhut T., Chaboureau J.-P., Escobar J. and Mascart P.: Giga-LES de Hector the Convecteur : caractérisation de la convection très profonde. Atmospheric Modélisation Workshops, Toulouse, France, 19-23 Jan. 2015.
9. Chaboureau J.-P., Dauhut T., Escobar J. and Mascart P.: Large-Eddy Simulation of Hector the Convecteur making the stratosphere wetter. TRO-pico project meeting, Paris, France, 21 March 2014.
10. Dauhut T., Chaboureau J.-P., Escobar J. and Mascart P.: LES de l'orage Hector au Nord de l'Australie. Meso-NH Users Meeting, Toulouse, France, 21-22 Nov. 2013.

General public communication

1. Hector l'orage devenu la star du climat, Sciences et Vie, pp 63-65, Jan. 2017
2. Hector the convecteur, participation to « la fête de la science », 15 Oct. 2016
3. Les deux gigantesques ascendances d'Hector the Convecteur, actualité de l'INSU, Oct. 2016
4. Hector the convecteur hydrate la stratosphère, actualité de l'INSU, Sept. 2014