

Camille VIATTE

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RESEARCH INTERESTS

Fourier Transform InfraRed (FTIR) spectrometry, Atmospheric remote-sensing, radiative transfer, atmospheric physics and chemistry, trace gases and climate

EDUCATION AND TRAINING

- Sept. 2014 to now** **Senior Staff Scientist** (Prof. Dr. Wennberg, O. P.) in Environmental Science and Engineering at Caltech (Pasadena, USA):
- ✓ Validation of XCO₂ derived from the Orbiting Carbon Observatory-2 (OCO-2) with the Total Carbon Column Observing Network (TCCON)
 - ✓ Study of fossil fuel signature of XCO₂ in OCO-2 measurements and comparisons with the GEOS-Chem model.
- May 2014** **Postdoctoral fellow** (Prof. Dr. Wennberg, O. P.) in Environmental Science and Engineering at Caltech (Pasadena, USA):
- Sept. 2014** ***"Measurements of Greenhouses Gases (GHGs) in the Los Angeles megacities using a mobile Fourier Transform Spectrometer (FTS)"***
- ✓ Development and maintenance of a new mobile FTS (EM27SUN, Bruker)
 - ✓ Calibration of the EM27SUN with TCCON (code: GGG)
 - ✓ Field campaign (January 2015):
 - Inter-comparison of GHG measurements (XCO₂, XCH₄, and XCO) using four mobile FTS (EM27SUN)
 - Estimation of methane emissions from dairy farms in the Los Angeles Basin
- Sept. 2011** **Postdoctoral fellow** (Prof. Dr. Strong, K.) at the Department of Physics of University of Toronto (Canada):
- March 2014** ***"Observation of pollution and biomass burning events with FTIR measurements at the Polar Environment Atmospheric Research Laboratory (PEARL, Eureka, Canada)"***
- ✓ Optimization of atmospheric retrievals for harmonisation in the Network for the Detection of Atmospheric Composition Change (NDACC, code: SFIT2/SFIT4)
 - ✓ Characterization and retrievals of tropospheric species (CO, C₂H₆, HCN, C₂H₂, HCOOH, CH₃OH, and H₂CO) in the Arctic, and comparisons with the Atmospheric Chemistry Experiment Fourier Transform Spectrometer (ACE-FTS)
 - ✓ Estimation of fire emissions with transport models and FTIR measurements in the Arctic
 - ✓ One-month collaboration at at NCAR Earth System Laboratory (Boulder, USA)
 - ✓ Outreach about atmospheric physics and climate in Ontario's and Nunavut's schools (Canada) via CANDAC network
- Dec. 2007** **Ph.D. Thesis** (Prof. Dr. Orphal, J.) at Laboratoire Interuniversitaire des Systemes Atmospheriques (LISA, Creteil, France):
- May 2011** ***"Measurements of atmospheric trace gases using FTIR measurements at Izaña (Tenerife, Spain) and using a new observatory (OASIS) in Créteil near Paris (France)"***
- ✓ Installation and operation of a ground-based medium-resolution FTIR (Vertex 80, Bruker) in Créteil (Paris suburbs)

- ✓ Calibration and automatization of the OASIS observatory, optimization of data quality
- ✓ Analysis of infrared spectra (retrieval techniques, radiative transfer, optimal estimation, code: PROFFIT)

- ✓ Comparison of O₃ and CO total columns with satellites data derived from the Infrared Atmospheric Sounding Interferometer (IASI), the Ozone Monitoring Instrument (OMI), and the Global Ozone Monitoring Experiment-2 (GOME-2)
- ✓ Two-month measurements campaign at Izaña observatory (TCCON/NDACC site), Tenerife, Spain
- ✓ Validation of IASI O₃ total columns over Izaña with ground-based FTIR and Brewer instruments

2007 - 2011 Teaching assistant at Université Paris-Est (Créteil, Paris, France)

2005 - 2007 Research Master's Degree in Physics at Université Versailles Saint-Quentin (UVSQ), France

2004 - 2005 Student of Physics and Matter Sciences at UVSQ, France

PROFESSIONAL EXPERIENCE

Publications

- 2016**
- **Viatte, C.**, Hedelius, J., Chen, J., Parker, H., Jones, T., Franklin, J., Dubey, M. K., Wofsy, S., Wennberg, P. O.: *Methane emissions from dairies in the Los Angeles Basin*, submitted in ACP.
 - Hedelius, J., **Viatte, C.**, Wunch, D., Toon, G., Roehl, C., Chen, J., Jones, T., Wofsy, S., Franklin, J., Parker, H., Butterfield, Z., Dubey, M., Wennberg, P.: *Intercomparison of XGas measurements from multiple Low and High-Resolution Near IR Solar Viewing Spectrometers*, manuscript in preparation, Atmos. Meas. Tech., amt-2016-39, in review.
 - Chen, J., **Viatte, C.**, Hedelius, J. K., Jones, T., Franklin, J. E., Parker, H., Gottlieb, E. W., Wennberg, P. O., Dubey, M. K., and Wofsy, S. C.: *Differential Column Measurements Using Compact Solar-Tracking Spectrometers*, Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2015-1058, in review.
- 2015**
- **Viatte, C.**, Strong, K., Hannigan, J., Nussbaumer, E., Emmons, L. K., Conway, S., Paton-Walsh, C., Hartley, J., Benmergui, J., and Lin, J.: *Identifying fire plumes in the Arctic with tropospheric FTIR measurements and transport models*, Atmos. Chem. Phys., 15, 2227-2246, doi:10.5194/acp-15-2227-2015.
- 2014**
- Chelin, P., **Viatte, C.**, Ray, M., Eremenko, M., Cuesta, J., Hase, F., Orphal, J., and Flaud, J.-M: *The OASIS Observatory Using Ground-Based Solar Absorption Fourier-Transform Infrared Spectroscopy in the Suburbs of Paris (Créteil -France)*, Environment, Energy and Climate Change I: Environmental Chemistry of Pollutants and Wastes, Hdb Env Chem, DOI 10.1007/698_2014_270, E. Jimenez et al. editions (Book Chapter).
 - **Viatte, C.**, Strong, K., Walker, K. A., and Drummond, J. R.: *Five years of CO, HCN, C₂H₆, C₂H₂, CH₃OH, HCOOH and H₂CO total columns measured in the Canadian high Arctic*, Atmos. Meas. Tech., 7, 1547-1570, doi:10.5194/amt-7-1547-2014.
- 2013**
- **Viatte, C.**, Strong, K., Paton-Walsh, C., Mendonca, J., O'Neill, N.T., and Drummond, J. R.:

Measurements of CO, HCN and C₂H₆ total columns in smoke plumes transported from the 2010 Russian boreal forest fires to the Canadian high Arctic, Atmosphere-Ocean, 1–10, doi:10.1080/07055900.2013.823373.

- 2011**
- **Viatte, C.**, Schneider, M., Redondas, A., Hase, F., Eremenko, M., Chelin, P., Flaud, J.-M., Blumenstock, T., and Orphal, J.: *Comparison of ground-based FTIR and Brewer O₃ total column with data from two different IASI algorithms and from OMI and GOME-2 satellite instruments*, Atmos. Meas. Tech., 4, 535-546, doi:10.5194/amt-4-535-2011.
 - **Viatte, C.**, Gaubert, B., Eremenko, M., Hase, F., Schneider, M., Blumenstock, T., Ray, M., Chelin, P., Flaud, J.M., and Orphal, J.: *Tropospheric and total ozone columns over Paris (France) measured using medium-resolution ground-based solar-absorption Fourier-transform infrared spectroscopy*, Atmos. Meas. Tech., 4, 2323–2331, doi:10.5194/amt-4-2323-2011.
 - Tran H., Picquet-Varrault, B., Boursier, C., **Viatte, C.**, Eremenko, M., Hase, F., and Hartmann, J.M.: *Non-Voigt line-shape effects on retrievals of atmospheric ozone: Line-mixing effects*, J. Quant. Spectrosc. Radiat. Transf., 112, 2287-2295.

Posters and presentations

- 2016**
- Mar.
- **OCO-2 Science Team Meeting (STM)**, Pasadena, USA:
 - **Viatte, C.**, Wennberg, O. P., Liu, J., Wunch, D., and Roehl, C.: *Are fossil fuel XCO₂ signal detected by OCO-2?* Oral.
 - Hedelius, J., **Viatte, C.**, Wunch, D., Roehl, C., and Wennberg, P. O.: *EM27/SUN Mobile FT Spectrometers: Potential Supplemental OCO-2 Validation Measurement.* Oral.
 - Wennberg, P. O., Wunch, D., **Viatte, C.**, Roehl, C., and Osterman, G.: *XCO₂ Validation Overview.* Oral.
- 2015**
- Dec.
- **American Geoscience Union (AGU)**, San Francisco, USA:
 - **Viatte, C.**, Lauvaux, T., Hedelius, J., Parker, H., Chen, J., Jones, T., Franklin, J. E., Deng, A. J., Gaudet, B., Duren, R., Verhulst, K., Wunch, D., Roehl, C., Dubey, M. K., Wofsy, S., and Wennberg, P. O.: *Estimating methane emissions from dairies in the Los Angeles Basin.* Poster.
 - Wennberg, O. P., Wunch, D., **Viatte, C.**, O'Dell, C., Liu J., Frankenberg, C., Fisher, B., Mandrake, L., Osterman, G., Eldering, A., Crisp, D., and Gunson, M.: *Dynamics of CO₂ exchange and transport: The first year of OCO-2 observations.* Oral.
- June
- **International Workshop on Greenhouse Gas Measurements from Space (IWGGMS-11)**, Pasadena, USA: Hedelius, J., **Viatte, C.**, Wunch, D., Roehl, C., and Wennberg P. O.: *Mobile-FTS Standardization and X_{CO2} Measurements in the Greater Pasadena Area.* Poster.
 - **IRWG/NDACC meeting**, Toronto, Canada: **Viatte, C.**, Hedelius, J., Parker, H., Chen, J., Jones, T., Franklin, J. E., Lauvaux, T., Deng, A. J., Gaudet, B., Duren, R., Verhulst, K., Wunch, D., Roehl, C., Dubey, M. K., Wofsy, S., and Wennberg, P. O.: *EM27/SUN campaign at Caltech in January 2015.* Oral.

- 2014
Dec. - **AGU**, San Francisco, USA: Lutsch, E., **Viatte, C.**, Strong, K., Kasai, Y., Hannigan, J. W., and Nussbaumer, E.: *FTIR Measurements of Biomass Burning Species in the Arctic*. Poster.
- Oct. - **Megacities Carbon Project**, Pasadena, USA: **Viatte, C.** and Hedelius, J.: *New Mobile FTS (EM27/SUN)*. Oral.
- 2013
Nov. - **NCAR seminar**, Boulder, USA: **Viatte, C.**, Strong, K., Hannigan, J., Nussbaumer, E., Emmons, L., K., Conway, S., Paton-Walsh, C., Hartley, J., Benmergui, J., and Mendonca, J.: *FTIR measurements of tropospheric species in the high Arctic to investigate pollution events from fires*. Oral.
- July - **Arctic Atmospheric Science Summer School**, Alliston, Canada: **Viatte, C.**, Strong, K., Paton-Walsh, C., Hartley, J., Mendonca, J., O'Neill, N.T., Drummond J. R.: *Observation of biomass burning species at Eureka*. Poster.
- June - **Meeting, Arlington**, Virginia, USA: Strong, K., Colebatch, O., Conway, S., Fogal, P., Griffin, D., Jones, D.B.A., Mariani, Z., Mendonca, J., Semelhago, M., Stanevich, I., **Viatte, C.**, Walker, K.A., Weaver, D., Whaley, C., Lindenmaier, R., Fast, H., Mittermeier, R., Drummond, J.R., Franklin, J., Giroux, J.G., and Lin, J.C.: *Probing Atmospheric Composition over Canada using Ground-based FTIR Spectroscopy*. Optical Society of America Fourier Transform Spectroscopy (OSA-FTS), In Imaging and Applied Optics (Optical Society of America, Washington, DC, 2013).
- **IRWG/NDACC meeting**, Abashiri, Japan:
- **Viatte, C.** and Strong, K.: *Optimizing tropospheric retrievals at Eureka*. Poster.
 - **Viatte, C.**, Strong, K., Paton-Walsh, C., Hartley, J., and Mendonca, J.: *Measurements of tropospheric trace gases at PEARL, Eureka, Nunavut, Canada, from 2007 to 2011*. Oral.
 - Conway, S., Strong, K., **Viatte, C.**, and Whaley, C.: *Optimizing strato-mesospheric species retrievals at Eureka and Toronto: Carbon Monoxide*. Oral.
 - Weaver, D., Strong, K., **Viatte, C.**, Mendonca, J., and Fogal, P.: *Eureka Site Report*. Oral.
- May - **Joint Scientific Congress of the CMOS, CGU and CWRA**, Saskatoon, Canada: Saha, A., O'Neill, N.T., Stone, R.S., Strong, K., **Viatte, C.**, Eloranta, E., Abboud, I., Fioletov, V., and Herber, A.: *Seasonal and inter-annual variations in aerosol optical properties over the High Arctic*. Oral.
- Feb. - **Toronto District School Board (TDSB) Eureka Conference**, Toronto, Canada: **Viatte, C.**, and Strong K.: *The Climate change*. Oral.
- Jan/Feb. - **IRWG/NORS Error Analysis Workshop**, Boulder, USA: Whaley, C., **Viatte, C.**, Conway, S., Fogal, P., and Strong, K.: *Retrievals at U of T: Toronto and Eureka Stations*. Oral.
- 2012
August - **Quadrennial Ozone Symposium (QOS) meeting**, Toronto, Canada: Chelin, P., **Viatte, C.**, Le Troquer, N., Eremenko, M., Ray, Cuesta, M. J., Orphal, J., Flaud, J.M.: *Measurements of atmospheric trace gases using Fourier-Transform Infrared Spectroscopy at Izaña (Tenerife) and using a new observatory (OASIS) at Créteil near Paris (France)*. Poster.

- June - **IRWG/NDACC meeting**, Wengen, Switzerland:
- **Viatte, C.**, Lindenmaier, R., Jones, D.B.J., Strong, K., O'Neill, N.T., and Saha, A.: *Measurements of trace gas emissions from biomass burning events detected at PEARL, Eureka, Nunavut, Canada, from 2007 to 2011*. Oral.
 - **Viatte, C.**, Lindenmaier, R., and Strong, K.: *Optimizing FTIR Retrievals at Eureka*. Poster.
 - Strong, K., Lindenmaier, R., Mendonca, J., **Viatte, C.**, Weaver, D., and Fogal, P.: *Eureka Site Report*. Oral
- May/
June - **46th Canadian Meteorological and Oceanographic Society (CMOS) Congress**, Montreal, Canada:
- **Viatte, C.**, Lindenmaier, R., and Strong, K.: *Optimizing FTIR Retrievals at Eureka*. Poster.
 - **Viatte, C.**, Lindenmaier, R., Strong, K., O'Neill, N.T., and Saha, A.: *Measurements of trace gas emissions from biomass burning events at PEARL, Eureka, Nunavut, Canada, from 2007 to 2011*. Oral.
- April - **Conference, International Polar Year (IPY)**, Montreal, Canada: Saha, A., O'Neill, N.T., Eloranta, E.W., Stone, R.S., Lindenmaier, R., Strong, K., Herber, A., Savastiouk, V., **Viatte, C.**, Daou, D., Lupu, A., and Abboud, I.: *Multi-year characterization of aerosol optical properties over a Canadian High Arctic Site*. Poster.
- 2010**
June - **European Geoscience Union (EGU)**, Vienna, Austria: Eremenko, M., Dufour, G., Forêt, G., Griesfeller, A., Meijer, J., Gaubert, B., **Viatte, C.**, Coman, A., Beekmann, M., and Flaud, J.-M.: *Three summers of tropospheric ozone measurements over Europe with IASI*. Oral.
- March - **SIRTA** (Ecole Polytechnique Campus, France) in the frame of MEGAPOLI campaign: **Viatte, C.**: *Mesures par spectroscopie IR de l'ozone à partir du sol avec OASIS*. Poster.
- 2008**
August - **Earth Observation Summer School (ESA)**, Frascati, Italy: **Viatte, C.**, Chelin, P., Eremenko, M., Flaud, J.M., Orphal, J., and Ray, M.: *A new spectroscopic observatory in Creteil to measure atmospheric trace gases in solar occultation geometry*. Poster.
- July - **Atmospheric Spectroscopy Applications (ASA)**, Reims, France: **Viatte, C.**, Chelin, P., Eremenko, M., Flaud, J.M., Orphal, J., and Ray, M.: *OASIS, a new Spectroscopic observatory in Creteil to measure atmospheric trace gases in solar occultation*. Poster.
- 2007**
March - **AGU**, San Francisco, USA: Chazette, P., Dulac, F., Kim S., Rault, J., **Viatte, C.**, Berthier, S., and Sanak, J.: *Ground-based and ultralight air-borne lidar to detect multilayered aerosol in frame of AMMA*. Poster.

Experimental studies and reports

- Feb/June2007** Radiative impact of aerosols in the planetary boundary layer (LSCE, Saclay, France)
- May/June 2006** Measurements of Cs¹³⁷ in Northern Greece ecosystems (Univ. of Agriculture, Athens, Greece)
- June 2005** Study of runaways electrons in the ionosphere (CETP, Vélizy, France)

PROFESSIONAL SERVICE and AWARDS

- NASA award for the 2nd class of the Giovanni Image Hall of Fame (February 2016)
- Campaign lead organizer at Caltech, Pasadena, USA (January 2015)
- Student poster judge at the Arctic Atmospheric Science Summer School (July 2013)
- Journal article reviewer at the Atmospheric Measurement Technics Journal (2012, 2014, 2015, 2016)
- Outreach activities (kinder garden to teacher levels): presentation on climate change, instrumentation, hands-on activities in Ontario and Nunavut, Canada (2011-2013)
- Radio Interview about the ozone hole in the Arctic (French, Radio-Canada): http://www.radio-canada.ca/emissions/Libre_echange/2011-2012/archives.asp?date=2012-02-02 (Feb 2012)
- Teaching assistant at Université Paris-Est (Créteil, Paris, France): ~ 200 hours of teaching in optics, physics, and mathematics (2007-2011).

COMPUTER TOOLS

- Retrieval codes: GFIT (GGG), SFIT4 (SFIT2) and PROFFIT
- Softwares: Matlab, Origin, LINUX, IDL, OPUS, HITRAN
- Word, Excel, PowerPoint

FOREIGN LANGUAGES

- English: fluent
- Spanish: fluent
- French: fluent

HOBBIES AND SPECIAL INTERESTS

- Music (flute, trumpet, sing), sports (swim, tennis, run), travel
- Child education (diploma as trainer)