

Below is a selection of publications in peer-reviewed scientific journals of Michel Abgrall, Jocelyne Guéna et Daniele Rovera. These publications relate to the realization, the use and the provision of primary frequency and time references.

Bibliography

- [1] J. Guéna, S. Weyers, M. Abgrall, C. Grebing, V. Gerginov, P. Rosenbusch, S. Bize, B. Lipphardt, H. Denker, N. Quintin, S. M. F. Raupach, D. Nicolodi, F. Stefani, N. Chiodo, S. Koke, A. Kuhl, F. Wiotte, F. Meynadier, E. Camisard, C. Chardonnet, Y. L. Coq, M. Lours, G. Santarelli, A. Amy-Klein, R. L. Targat, O. Lopez, P. E. Pottie, and G. Grosche, “First international comparison of fountain primary frequency standards via a long distance optical fiber link,” *Metrologia*, vol. 54, no. 3, p. 348, 2017. [Online]. Available: <http://stacks.iop.org/0026-1394/54/i=3/a=348>
- [2] M. Abgrall, J. Guéna, M. Lours, G. Santarelli, M. E. Tobar, S. Bize, S. Grop, B. Dubois, C. Fluhr, and V. Giordano, “High-stability comparison of atomic fountains using two different cryogenic oscillators,” *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, vol. 63, no. 8, pp. 1198–1203, Aug 2016. [Online]. Available: <https://doi.org/10.1109/TUFFC.2016.2570898>
- [3] M. Abgrall, S. Bize, B. Chupin, J. Guéna, P. Laurent, P. Rosenbusch, and D. Rovera, “Le nouvel UTC(OP) fondé sur les fontaines atomiques du LNE-SYRTE,” *Revue Française de Métrologie*, vol. 43, p. 17, 2016. [Online]. Available: <http://dx.doi.org/10.1051/rfm/2016012>
- [4] G. D. Rovera, M. Abgrall, C. Courde, P. Exertier, P. Fridelance, P. Guillemot, M. Laas-Bourez, N. Martin, E. Samain, R. Sherwood, J.-M. Torre, and P. Urich, “A direct comparison between two independently calibrated time transfer techniques: T2L2 and GPS Common-Views,” *Journal of Physics: Conference Series*, vol. 723, no. 1, p. 012037, 2016. [Online]. Available: <http://stacks.iop.org/1742-6596/723/i=1/a=012037>
- [5] P. Exertier, E. Samain, C. Courde, M. Aymar, J. M. Torre, G. D. Rovera, M. Abgrall, P. Urich, R. Sherwood, G. Herold, U. Schreiber, and P. Guillemot, “Sub-ns time transfer consistency: a direct comparison between GPS CV and T2L2,” *Metrologia*, vol. 53, no. 6, p. 1395, 2016. [Online]. Available: <http://stacks.iop.org/0026-1394/53/i=6/a=1395>
- [6] A. Hees, J. Guéna, M. Abgrall, S. Bize, and P. Wolf, “Searching for an oscillating massive scalar field as a dark matter candidate using atomic hyperfine frequency comparisons,” *Phys. Rev. Lett.*, vol. 117, p. 061301, Aug 2016. [Online]. Available: <http://link.aps.org/doi/10.1103/PhysRevLett.117.061301>
- [7] C. Lisdar, G. Grosche, N. Quintin, C. Shi, S. Raupach, C. Grebing, D. Nicolodi, F. Stefani, A. Al-Masoudi, S. Dorscher, S. Hafner, J.-L. Robyr, N. Chiodo, S. Bilicki, E. Bookjans, A. Koczwara, S. Koke, A. Kuhl, F. Wiotte, F. Meynadier, E. Camisard, M. Abgrall, M. Lours, T. Legero, H. Schnatz, U. Sterr, H. Denker, C. Chardonnet, Y. Le Coq, G. Santarelli, A. Amy-Klein, R. Le Targat, J. Lodewyck, O. Lopez, and P.-E. Pottie, “A clock network for geodesy and fundamental science,” *Nat Commun*, vol. 7, p. 12443, Aug. 2016. [Online]. Available: <http://dx.doi.org/10.1038/ncomms12443>
- [8] J. Lodewyck, S. Bilicki, E. Bookjans, J.-L. Robyr, C. Shi, G. Vallet, R. L. Targat, D. Nicolodi, Y. L. Coq, J. Guéna, M. Abgrall, P. Rosenbusch, and S. Bize, “Optical to microwave clock frequency ratios with a nearly continuous strontium optical lattice clock,” *Metrologia*, vol. 53, no. 4, p. 1123, 2016. [Online]. Available: <http://stacks.iop.org/0026-1394/53/i=4/a=1123>
- [9] G. D. Rovera, S. Bize, B. Chupin, J. Guéna, P. Laurent, P. Rosenbusch, P. Urich, and M. Abgrall, “UTC(OP) based on LNE-SYRTE atomic fountain primary frequency standards,” *Metrologia*, vol. 53, no. 3, p. S81, 2016. [Online]. Available: <http://stacks.iop.org/0026-1394/53/i=3/a=S81>

- [10] R. Tyumenev, M. Favier, S. Bilicki, E. Bookjans, R. L. Targat, J. Lodewyck, D. Nicolodi, Y. L. Coq, M. Abgrall, J. Guéna, L. D. Sarlo, and S. Bize, “Comparing a mercury optical lattice clock with microwave and optical frequency standards,” *New Journal of Physics*, vol. 18, no. 11, p. 113002, 2016. [Online]. Available: <http://stacks.iop.org/1367-2630/18/i=11/a=113002>
- [11] M. Abgrall, B. Chupin, L. D. Sarlo, J. Guéna, P. Laurent, Y. L. Coq, R. L. Targat, J. Lodewyck, M. Lours, P. Rosenbusch, G. D. Rovera, and S. Bize, “Atomic fountains and optical clocks at SYRTE: Status and perspectives,” *Comptes Rendus Physique*, vol. 16, no. 5, pp. 461 – 470, 2015, the measurement of time / La mesure du temps. [Online]. Available: <http://www.sciencedirect.com/science/article/pii/S1631070515000614>
- [12] B. Argence, B. Chanteau, O. Lopez, D. Nicolodi, M. Abgrall, C. Chardonnet, C. Daussy, B. Darquié, Y. Le Coq, and A. Amy-Klein, “Quantum cascade laser frequency stabilization at the sub-Hz level,” *Nat Photon*, vol. advance online publication, no. 9, p. 456, Jun. 2015. [Online]. Available: <http://dx.doi.org/10.1038/nphoton.2015.93>
- [13] J. Guéna, M. Abgrall, A. Clairon, and S. Bize, “Contributing to TAI with a secondary representation of the SI second,” *Metrologia*, vol. 51, no. 1, p. 108, 2014. [Online]. Available: <http://stacks.iop.org/0026-1394/51/i=1/a=108>
- [14] P. Laurent, M. Abgrall, I. Moric, P. Lemonde, G. Santarelli, A. Clairon, S. Bize, D. Rovera, J. Guéna, C. Salomon, and et al., “PHARAO : le premier étalon primaire de fréquence, à atomes froids, spatial,” *Revue Française de Métrologie*, vol. 34, pp. 3–21, 2014. [Online]. Available: <http://dx.doi.org/10.1051/rfm/2014005>
- [15] J. J. McFerran, L. Yi, S. Mejri, W. Zhang, S. Di Manno, M. Abgrall, J. Guéna, Y. Le Coq, and S. Bize, “Statistical uncertainty of 2.5×10^{-16} for the $^{199}\text{Hg } ^1\text{S}_0-^3\text{P}_0$ clock transition against a primary frequency standard,” *Phys. Rev. A*, vol. 89, p. 043432, Apr 2014. [Online]. Available: <http://link.aps.org/doi/10.1103/PhysRevA.89.043432>
- [16] G. D. Rovera, J.-M. Torre, R. Sherwood, M. Abgrall, C. Courde, M. Laas-Bourez, and P. Urich, “Link calibration against receiver calibration: an assessment of GPS time transfer uncertainties,” *Metrologia*, vol. 51, no. 5, p. 476, 2014. [Online]. Available: <http://stacks.iop.org/0026-1394/51/i=5/a=476>
- [17] B. Chanteau, O. Lopez, W. Zhang, D. Nicolodi, B. Argence, F. Auguste, M. Abgrall, C. Chardonnet, G. Santarelli, B. Darquié, Y. L. Coq, and A. Amy-Klein, “Mid-infrared laser phase-locking to a remote near-infrared frequency reference for high-precision molecular spectroscopy,” *New Journal of Physics*, vol. 15, no. 7, p. 073003, 2013. [Online]. Available: <http://stacks.iop.org/1367-2630/15/i=7/a=073003>
- [18] R. Le Targat, L. Lorini, Y. Le Coq, M. Zawada, J. Guéna, M. Abgrall, M. Gurov, P. Rosenbusch, D. G. Rovera, B. Nagórny, R. Gartman, P. G. Westergaard, M. E. Tobar, M. Lours, G. Santarelli, A. Clairon, S. Bize, P. Laurent, P. Lemonde, and J. Lodewyck, “Experimental realization of an optical second with strontium lattice clocks,” *Nat Commun*, vol. 4, p. 2109, Jul. 2013. [Online]. Available: <http://dx.doi.org/10.1038/ncomms3109>
- [19] A. Matveev, C. G. Parthey, K. Predehl, J. Alnis, A. Beyer, R. Holzwarth, T. Udem, T. Wilken, N. Kolachevsky, M. Abgrall, D. Rovera, C. Salomon, P. Laurent, G. Grosche, O. Terra, T. Legero, H. Schnatz, S. Weyers, B. Altschul, and T. W. Hänsch, “Precision measurement of the hydrogen $1\text{S}-2\text{S}$ frequency via a 920-km fiber link,” *Phys. Rev. Lett.*, vol. 110, p. 230801, Jun 2013. [Online]. Available: <http://link.aps.org/doi/10.1103/PhysRevLett.110.230801>

- [20] M. E. Tobar, P. L. Stanwix, J. J. McFerran, J. Guéna, M. Abgrall, S. Bize, A. Clairon, P. Laurent, P. Rosenbusch, D. Rovera, and G. Santarelli, “Testing local position and fundamental constant invariance due to periodic gravitational and boost using long-term comparison of the syrté atomic fountains and H-masers,” *Phys. Rev. D*, vol. 87, p. 122004, Jun 2013. [Online]. Available: <http://link.aps.org/doi/10.1103/PhysRevD.87.122004>
- [21] J. Guéna, M. Abgrall, D. Rovera, P. Rosenbusch, M. E. Tobar, P. Laurent, A. Clairon, and S. Bize, “Improved tests of local position invariance using ^{87}Rb and ^{133}Cs fountains,” *Phys. Rev. Lett.*, vol. 109, p. 080801, Aug 2012. [Online]. Available: <http://link.aps.org/doi/10.1103/PhysRevLett.109.080801>
- [22] J. Guéna, M. Abgrall, D. Rovera, P. Laurent, B. Chupin, M. Lours, G. Santarelli, P. Rosenbusch, M. Tobar, R. Li, K. Gibble, A. Clairon, and S. Bize, “Progress in atomic fountains at LNE-SYRTE,” *Ultrasonics, Ferroelectrics and Frequency Control, IEEE Transactions on*, vol. 59, no. 3, pp. 391–410, march 2012. [Online]. Available: <https://doi.org/10.1109/TUFFC.2012.2208>
- [23] C. G. Parthey, A. Matveev, J. Alnis, B. Bernhardt, A. Beyer, R. Holzwarth, A. Maistrou, R. Pohl, K. Predehl, T. Udem, T. Wilken, N. Kolachevsky, M. Abgrall, D. Rovera, C. Salomon, P. Laurent, and T. W. Hänsch, “Improved measurement of the hydrogen 1S-2S transition frequency,” *Phys. Rev. Lett.*, vol. 107, p. 203001, Nov 2011. [Online]. Available: <http://link.aps.org/doi/10.1103/PhysRevLett.107.203001>
- [24] J. J. McFerran, L. Yi, S. Mejri, S. Di Manno, W. Zhang, J. Guéna, Y. Le Coq, and S. Bize, “Neutral atom frequency reference in the deep ultraviolet with a fractional uncertainty $= 5.7 \times 10^{-15}$,” *Phys. Rev. Lett.*, vol. 108, p. 183004, May 2012. [Online]. Available: <http://link.aps.org/doi/10.1103/PhysRevLett.108.183004>
- [25] M. Chwalla, J. Benhelm, K. Kim, G. Kirchmair, T. Monz, M. Riebe, P. Schindler, A. S. Villar, W. Hansel, C. F. Roos, R. Blatt, M. Abgrall, G. Santarelli, G. D. Rovera, and P. Laurent, “Absolute frequency measurement of the $^{40}\text{Ca}^+ 4s\ ^2\text{S}_{1/2}$ - $3d\ ^2\text{D}_{5/2}$ clock transition,” *Phys. Rev. Lett.*, vol. 102, no. 2, p. 023002, 2009. [Online]. Available: <http://link.aps.org/abstract/PRL/v102/e023002>
- [26] J. Millo, M. Abgrall, M. Lours, E. M. L. English, H. Jiang, J. Guéna, A. Clairon, M. E. Tobar, S. Bize, Y. L. Coq, and G. Santarelli, “Ultralow noise microwave generation with fiber-based optical frequency comb and application to atomic fountain clock,” *Applied Physics Letters*, vol. 94, no. 14, p. 141105, 2009. [Online]. Available: <http://link.aip.org/link/?APL/94/141105/1>
- [27] X. Baillard, M. Fouché, R. L. Targat, P. G. Westergaard, A. Lecallier, F. Chapelet, M. Abgrall, G. D. Rovera, P. Laurent, P. Rosenbusch, S. Bize, G. Santarelli, A. Clairon, P. Lemonde, G. Grosche, B. Lipphardt, and H. Schnatz, “An optical lattice clock with spin-polarized ^{87}Sr atoms,” *Eur. Phys. J. D*, vol. 48, p. 11, 2008. [Online]. Available: <http://dx.doi.org/10.1140/epjd/e2007-00330-3>
- [28] P. Urich, D. Valat, and M. Abgrall, “Steering of the french time scale TA(F) towards the LNE-SYRTE primary frequency standards,” *Metrologia*, vol. 45, no. 6, p. S42, 2008. [Online]. Available: <http://stacks.iop.org/0026-1394/45/i=6/a=S07>
- [29] S. Bize, P. Laurent, M. Abgrall, H. Marion, I. Maksimovic, L. Cacciapuoti, J. Grünert, C. Vian, F. Pereira dos Santos, P. Rosenbusch, P. Lemonde, G. Santarelli, P. Wolf, A. Clairon, A. Luiten, M. Tobar, and C. Salomon, “Cold atom clocks and applications,” *J. Phys. B: Atomic, Molecular and Optical Physics*, vol. 38, no. 9, pp. S449–S468, 2005. [Online]. Available: <http://stacks.iop.org/0953-4075/38/S449>

- [30] C. Vian, P. Rosenbusch, H. Marion, S. Bize, L. Cacciapuoti, S. Zhang, M. Abgrall, D. Chambon, I. Maksimovic, P. Laurent, G. Santarelli, A. Clairon, A. Luiten, M. Tobar, and C. Salomon, “BNM-SYRTE Fountains: Recent Results,” *IEEE Trans. Instrum. Meas.*, vol. 54, p. 833, 2005. [Online]. Available: <https://doi.org/10.1109/TIM.2005.843573>
- [31] F. Allard, I. Maksimovic, M. Abgrall, and P. Laurent, “Automatic system to control the operation of an extended cavity diode laser,” *Rev. Sci. Instrum.*, vol. 75, p. 54, 2004. [Online]. Available: <http://link.aip.org/link/?RSI/75/54/1>
- [32] M. Fischer, N. Kolachevsky, M. Zimmermann, R. Holzwarth, T. Udem, T. W. Hänsch, M. Abgrall, J. Grunert, I. Maksimovic, S. Bize, H. Marion, F. P. D. Santos, P. Lemonde, G. Santarelli, P. Laurent, A. Clairon, C. Salomon, M. Haas, U. D. Jentschura, and C. H. Keitel, “New limits on the drift of fundamental constants from laboratory measurements,” *Phys. Rev. Lett.*, vol. 92, p. 230802, 2004. [Online]. Available: <https://doi.org/10.1103/PhysRevLett.92.230802>
- [33] H. Marion, F. Pereira Dos Santos, M. Abgrall, S. Zhang, Y. Sortais, S. Bize, I. Maksimovic, D. Calonico, J. Grünert, C. Mandache, P. Lemonde, G. Santarelli, P. Laurent, A. Clairon, and C. Salomon, “Search for variations of fundamental constants using atomic fountain clocks,” *Phys. Rev. Lett.*, vol. 90, p. 150801, 2003. [Online]. Available: <https://doi.org/10.1103/PhysRevLett.90.150801>
- [34] M. Niering, R. Holzwarth, J. Reichert, P. Pokasov, T. Udem, M. Weitz, T. W. Hänsch, P. Lemonde, G. Santarelli, M. Abgrall, P. Laurent, C. Salomon, and A. Clairon, “Measurement of the hydrogen 1S-2S transition frequency by phase coherent comparison with a microwave cesium fountain clock,” *Phys. Rev. Lett.*, vol. 84, p. 5496, 2000. [Online]. Available: <https://doi.org/10.1103/PhysRevLett.84.5496>
- [35] J. Guéna, R. Li, K. Gibble, S. Bize, and A. Clairon, “Evaluation of Doppler shifts to improve the accuracy of primary atomic fountain clocks,” *Phys. Rev. Lett.*, vol. 106, no. 13, p. 130801, Apr 2011. [Online]. Available: <https://doi.org/10.1103/PhysRevLett.106.130801>
- [36] J. Guéna, P. Rosenbusch, P. Laurent, M. Abgrall, D. Rovera, G. Santarelli, M. Tobar, S. Bize, and A. Clairon, “Demonstration of a dual alkali Rb/Cs fountain clock,” *Ultrasonics, Ferroelectrics and Frequency Control, IEEE Transactions on*, vol. 57, no. 3, p. 647, 2010. [Online]. Available: <https://doi.org/10.1109/TUFFC.2010.1461>
- [37] J. Guéna, G. Dudle, and P. Thomann, “An experimental study of intermodulation effects in an atomic fountain frequency standard,” *The European Physical Journal - Applied Physics*, vol. 38, no. 02, pp. 183–189, 2007. [Online]. Available: <http://dx.doi.org/10.1051/epjap:2007072>
- [38] G. Santarelli, G. Governatori, D. Chambon, M. Lours, P. Rosenbusch, J. Guéna, F. Chapelet, S. Bize, M. Tobar, P. Laurent, T. Potier, and A. Clairon, “Switching atomic fountain clock microwave interrogation signal and high-resolution phase measurements,” *Ultrasonics, Ferroelectrics and Frequency Control, IEEE Transactions on*, vol. 56, no. 7, pp. 1319–1326, July 2009. [Online]. Available: <https://doi.org/10.1109/TUFFC.2009.1188>
- [39] J. A. Stone, J. E. Decker, P. Gill, P. Juncar, A. Lewis, G. D. Rovera, and M. Viliésid, “Advice from the CCL on the use of unstabilized lasers as standards of wavelength: the helium-neon laser at 633 nm,” *Metrologia*, vol. 46, no. 1, pp. 11–18, 2009. [Online]. Available: <http://stacks.iop.org/0026-1394/46/11>
- [40] X. Baillard, M. Fouché, R. L. Targat, P. G. Westergaard, A. Lecallier, Y. L. Coq, G. D. Rovera, S. Bize, and P. Lemonde, “Accuracy evaluation of an optical lattice clock with bosonic atoms,” *Opt. Lett.*, vol. 32, p. 1812, 2007. [Online]. Available: <https://doi.org/10.1364/OL.32.001812>

- [41] R. Le Targat, X. Baillard, M. Fouché, A. Brusch, O. Tcherbakoff, G. D. Rovera, and P. Lemonde, “Accurate optical lattice clock with ^{87}Sr atoms,” *Phys. Rev. Lett.*, vol. 97, no. 13, p. 130801, 2006. [Online]. Available: <https://doi.org/10.1103/PhysRevLett.97.130801>
- [42] I. Courtillot, A. Quessada-Vial, A. Brusch, D. Kolker, G. D. Rovera, and P. Lemonde, “Accurate spectroscopy of Sr atoms,” *The European Physical Journal D - Atomic, Molecular, Optical and Plasma Physics*, vol. 33, pp. 161–171, 2005, 10.1140/epjd/e2005-00058-0. [Online]. Available: <http://dx.doi.org/10.1140/epjd/e2005-00058-0>
- [43] I. Courtillot, A. Quessada, R. Kovacich, A. Brusch, D. Kolker, J.-J. Zondy, G. Rovera, and P. Lemonde, “Clock transition for a future optical frequency standard with trapped atoms,” *Phys. Rev. A*, vol. 68, p. 030501, 2003. [Online]. Available: <https://doi.org/10.1103/PhysRevA.68.030501>