







# Alberto Vecchiato

## Publication list

### Publications on refereed journals

- 2015  Crosta, M., A. Vecchiato, F. de Felice, and M. G. Lattanzi. “The ray tracing analytical solution within the RAMOD framework. The case of a Gaia-like observer”. In: *Classical Quant. Grav.* 32.16, 165008, p. 165008. arXiv: 1501.03705 [gr-qc].
- 2015  Qi, Z., Y. Yu, B. Bucciarelli, M. G. Lattanzi, R. L. Smart, A. Spagna, B. J. McLean, Z. Tang, H. R. A. Jones, R. Morbidelli, L. Nicastro, and A. Vecchiato. “Absolute Proper Motions Outside the Plane (APOP)- A Step Toward the GSC2.4”. In: *Astron. J.* 150, 137, p. 137.
- 2014  Bernardi, G., A. Vecchiato, and B. Bucciarelli. “The possible astronomical function of the El Molle stone circle at the ESO Observatory La Silla. II: The updated measurement campaign”. In: *Journal of Astronomical History and Heritage* 17, pp. 216–221.
- 2014  Bertone, S., O. Minazzoli, M. Crosta, C. Le Poncin-Lafitte, A. Vecchiato, and M.-C. Angonin. “Time transfer functions as a way to validate light propagation solutions for space astrometry”. In: *Classical Quant. Grav.* 31.1, 015021, p. 015021. arXiv: 1306.2367 [gr-qc].
- 2014  Cantat-Gaudin, T., A. Vallenari, S. Zaggia, A. Bragaglia, R. Sordo, J. E. Drew, J. Eisloffel, H. J. Farnhill, E. Gonzalez-Solares, R. Greimel, M. J. Irwin, A. Kupcu-Yoldas, C. Jordi, R. Blomme, L. Sampedro, M. T. Costado, E. Alfaro, R. Smiljanic, L. Magrini, P. Donati, E. D. Friel, H. Jacobson, U. Abbas, D. Hatzidimitriou, A. Spagna, A. Vecchiato, L. Balaguer-Nunez, C. Lardo, M. Tosi, E. Pancino, A. Klutsch, G. Tautvaisiene, A. Drazdauskas, E. Puzeras, F. Jiménez-Esteban, E. Maiorca, D. Geisler, I. San Roman, S. Villanova, G. Gilmore, S. Randich, T. Bensby, E. Flaccomio, A. Lanzafame, A. Recio-Blanco, F. Damiani, A. Hourihane, P. Jofré, P. de Laverny, T. Masseron, L. Morbidelli, L. Prisinzano, G. G. Sacco, L. Sbordone, and C. C. Worley. “The Gaia-ESO Survey: Stellar content and elemental abundances in the massive cluster NGC 6705”. In: *Astron. Astrophys.* 569, A17, A17. arXiv: 1407.1510 [astro-ph.SR].
- 2013  Bini, D., M. Crosta, F. de Felice, A. Geralico, and A. Vecchiato. “The Erez-Rosen metric and the role of the quadrupole on light propagation”. In: *Classical Quant. Grav.* 30.4, 045009, p. 045009. arXiv: 1408.5264 [gr-qc].

- 2013 Smart, R. L., C. G. Tinney, B. Bucciarelli, F. Marocco, U. Abbas, A. Andrei, G. Bernardi, B. Burningham, C. Cardoso, E. Costa, M. T. Crosta, M. Dapr , A. Day-Jones, B. Goldman, H. R. A. Jones, M. G. Lattanzi, S. K. Leggett, P. Lucas, R. Mendez, J. L. Penna, D. Pinfield, L. Smith, A. Sozzetti, and A. Vecchiato. "NPARSEC: NTT Parallaxes of Southern Extremely Cool objects. Goals, targets, procedures and first results". In: *Mon. Not. R. Astron. Soc.* 433, pp. 2054–2063. arXiv: 1306.4527 [astro-ph.SR].
- 2012 Bernardi, G., A. Vecchiato, and B. Bucciarelli. "Possible astronomical meanings of some El Molle relics near the ESO Observatory at La Silla". In: *Journal of Astronomical History and Heritage* 15, pp. 137–145.
- 2012 Gai, M., A. Vecchiato, S. Ligor, A. Sozzetti, and M. G. Lattanzi. "Gravitation astrometric measurement experiment". In: *Exp. Astron.* 34, pp. 165–180. arXiv: 1203.5654 [astro-ph.IM].
- 2011 de Felice, F., G. Preti, M. T. Crosta, and A. Vecchiato. "Relativistic satellite astrometry: the stellar radial velocity". In: *Astron. Astrophys.* 528, A23, A23.
- 2010 Crosta, M. and A. Vecchiato. "Gaia relativistic astrometric models. I. Proper stellar direction and aberration". In: *Astron. Astrophys.* 509, A37, A37.
- 2009 Gai, M., A. Vecchiato, M. G. Lattanzi, S. Ligor, and D. Loreggia. "Gamma Astrometric Measurement Experiment (GAME) - Implementation and performance". In: *Adv. Space Res.* 44, pp. 588–596.
- 2009 Vecchiato, A., M. Gai, M. G. Lattanzi, M. Crosta, and A. Sozzetti. "Gamma astrometric measurement experiment (GAME) - Science case". In: *Advances in Space Research* 44, pp. 579–587.
- 2006 de Felice, F., A. Vecchiato, M. T. Crosta, B. Bucciarelli, and M. G. Lattanzi. "A General Relativistic Model of Light Propagation in the Gravitational Field of the Solar System: The Dynamical Case". In: *Astrophys. J.* 653, pp. 1552–1565. eprint: astro-ph/0609073.
- 2004 de Felice, F., M. T. Crosta, A. Vecchiato, M. G. Lattanzi, and B. Bucciarelli. "A General Relativistic Model of Light Propagation in the Gravitational Field of the Solar System: The Static Case". In: *Astrophys. J.* 607, pp. 580–595. eprint: astro-ph/0401637.
- 2003 Crosta, M. T., A. Vecchiato, F. de Felice, M. G. Lattanzi, and B. Bucciarelli. "Some Aspects of Relativistic Astrometry from Within the Solar System". In: *Celest. Mech. Dyn. Astron.* 87, pp. 209–218. eprint: astro-ph/0305399.

- 2003  
Vecchiato, A., M. G. Lattanzi, B. Bucciarelli, M. Crosta, F. de Felice, and M. Gai. "Testing general relativity by micro-arcsecond global astrometry". In: *Astron. Astrophys.* 399, pp. 337–342. eprint: astro-ph/0301323.
- 2001  
de Felice, F., B. Bucciarelli, M. G. Lattanzi, and A. Vecchiato. "General relativistic satellite astrometry. II. Modeling parallax and proper motion". In: *Astron. Astrophys.* 373, pp. 336–344.
- 1998  
de Felice, F., M. G. Lattanzi, A. Vecchiato, and P. L. Bernacca. "General relativistic satellite astrometry. I. A non-perturbative approach to data reduction". In: *Astron. Astrophys.* 332, pp. 1133–1141.

### Publications on refereed proceedings

- 2015  
Gai, M., A. Vecchiato, D. Busonero, A. Riva, M. G. Lattanzi, and M. Pisani. "Metrology for AGP - Astrometric Gravitation Probe". In: *Metrology for Aerospace (MetroAeroSpace), 2015 IEEE*, pp. 329–334.
- 2014  
Gai, M., A. Riva, D. Busonero, A. Vecchiato, M. G. Lattanzi, D. Gallieni, P. Lazzarini, G. Guglieri, I. Musso, and P. Navone. "GAME/ISAS development status". In: *Modeling, Systems Engineering, and Project Management for Astronomy VI*. Ed. by George Z. Angeli and Philippe Dierickx. Vol. 9150. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, p. 1.
- 2014  
Gai, M., A. Vecchiato, A. Riva, M. G. Lattanzi, A. Sozzetti, M. T. Crosta, and D. Busonero. "Astrometric tests of General Relativity in the Solar system". In: *J. Phys. Conf. Ser.* 490.1, 012240, p. 012240.
- 2014  
Vecchiato, A., M. Gai, M. G. Lattanzi, M. Crosta, U. Becciani, and S. Bertone. "Astrometric tests of General Relativity in the Solar System: mathematical and computational scenarios". In: *Journal of Physics Conference Series* 490.1, 012241, p. 012241. arXiv: 1312.3159 [gr-qc].
- 2012  
Bandieramonte, M., U. Becciani, A. Vecchiato, Mario G. Lattanzi, and B. Bucciarelli. "AVU-GSR Gaia Mission: A Hybrid Solution for HPC and Grid-MPI Infrastructures". In: *Enabling Technologies: Infrastructure for Collaborative Enterprises (WETICE), 2012 IEEE 21st International Workshop on*. Ed. by Sumitra Reddy and Khalil Drira, pp. 167–172.

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- 2012 Gai, M., A. Fienga, M. G. Lattanzi, A. Riva, A. Vecchiato, D. Gallieni, S. Chaillot, S. Ligorì, and D. Loreggia. "ISAS: interferometric stratospheric astrometry for solar system". In: *Ground-based and Airborne Instrumentation for Astronomy IV*. Ed. by Ian S. McLean, Suzanne K. Ramsay, and Hideki Takami. Vol. 8446. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, p. 4.
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- 2012 Gai, M., A. Vecchiato, S. Ligorì, A. Riva, M. G. Lattanzi, D. Busonero, A. Fienga, D. Loreggia, and M. T. Crosta. "Gravitation Astrometric Measurement Experiment (GAME)". In: *Optical and Infrared Interferometry III*. Ed. by Françoise Delplancke, Jayadev K. Rajagopal, and Fabien Malbet. Vol. 8445. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, p. 13.
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- 2012 Messineo, R., R. Morbidelli, M. Martino, E. Pigozzi, A. F. Mulone, and A. Vecchiato. "The Italian DPC: infrastructure and operations for the Italian contribution to the Gaia data processing and analysis consortium". In: *Software and Cyberinfrastructure for Astronomy II*. Ed. by Nicole M. Radziwill and Gianluca Chiozzi. Vol. 8451. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series,
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- 2012 Morbidelli, R., R. Messineo, D. Busonero, A. Riva, and A. Vecchiato. "Data access and analysis system for Gaia data handling during operations at Italian DPC: scientific validation and results monitoring approach in support of the AVU operations". In: *Software and Cyberinfrastructure for Astronomy II*. Ed. by Nicole M. Radziwill and Gianluca Chiozzi. Vol. 8451. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, p. 3.
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- 2012 Vecchiato, A., U. Abbas, M. Bandieramonte, U. Becciani, L. Bianchi, B. Bucciarelli, D. Busonero, M. G. Lattanzi, and R. Messineo. "The global sphere reconstruction for the Gaia mission in the Astrometric Verification Unit". In: *Software and Cyberinfrastructure for Astronomy II*. Ed. by Nicole M. Radziwill and Gianluca Chiozzi. Vol. 8451. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, p. 3.
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- 2010 Loreggia, D., M. Gai, S. Ligorì, A. Vecchiato, and M. G. Lattanzi. "Design of a four-mirror astrometric telescope for light bending measurements". In: *Space Telescopes and Instrumentation 2010: Optical, Infrared, and Millimeter Wave*. Ed. by Jacobus M. Oschmann, Mark C. Clampin, and Howard A. MacEwen. Vol. 7731. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, p. 1.
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- 2010 Riva, A., D. Busonero, M. Gai, M. T. Crosta, A. Vecchiato, and M. G. Lattanzi. "LEGOLAS: localizing evidence of gravitational waves by observations of light source astrometric signature". In: *Space Telescopes and Instrumentation 2010: Optical, Infrared, and Millimeter Wave*. Ed. by Jacobus M. Oschmann, Mark C. Clampin, and Howard A. MacEwen. Vol. 7731. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, p. 1.

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Gai, M., A. Vecchiato, S. Ligorì, S. Fineschi, and M. G. Lattanzi. "The Gamma Astrometric Measurement Experiment (GAME)". In: *Solar Physics and Space Weather Instrumentation III*. Ed. by Silvano Fineschi and Judy A. Fennelly. Vol. 7438. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series,

2008

Gai, M., M. G. Lattanzi, S. Ligorì, and A. Vecchiato. "GAME: Gamma Astrometric Measurement Experiment". In: *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*. Vol. 7010. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, p. 27.

## Proceedings

2015

Qi, Z., Y. Yu, R. L. Smart, M. G. Lattanzi, B. Bucciarelli, A. Spagna, B. J. McLean, Z. Tang, H. R. A. Jones, R. Morbidelli, L. Nicastro, A. Vecchiato, and R. Teixeira. "A Brief Overview of the Absolute Proper motions Outside the Plane catalog (APOP)". In: *Revista Mexicana de Astronomia y Astrofisica Conference Series*. Vol. 46. Revista Mexicana de Astronomia y Astrofisica, vol. 27, pp. 81–.

2015

Vecchiato, A., U. Abbas, U. Becciani, L. Bianchi, B. Bucciarelli, M. Crosta, and M. G. Lattanzi. "Gaia Reference frame determination: the AVU/GSR pipeline". In: *IAU General Assembly 22*, p. 41746.

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Vecchiato, A., G. Bernardi, and B. Bucciarelli. "Possible Astronomical meaning of some El Molle findings at the ESO Observatory of La Silla". In: *IAU General Assembly 22*, p. 21949.

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Vecchiato, A., A. Fienga, M. Gai, M. G. Lattanzi, A. Riva, and D. Busonero. "Astrometric Gravitation Probe: a space mission concept for fundamental physics". In: *IAU General Assembly 22*, p. 47746.

2015

Vecchiato, A. and M. Gai. "Satellite Tracking Astrometric Network (STAN)". In: *IAU General Assembly 22*, p. 36451.

2015

Vecchiato, A., M. Gai, S. Capozziello, and M. de Laurentis. "Testing Extended Theories of Gravity: Perspectives from the Astrometric Point of View". In: *Thirteenth Marcel Grossmann Meeting: On Recent Developments in Theoretical and Experimental General Relativity, Astrophysics and Relativistic Field Theories*. Ed. by K. Rosquist, pp. 1137–1139.

2015

Vecchiato, A., M. Gai, and D. Hajdukovic. "Astrometric detection of gravitational effects of quantum vacuum". In: *IAU General Assembly 22*, p. 47753.

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- 2015 Vecchiato, A., M. Gai, M. G. Lattanzi, and S. Ligori. "Game: a Space Mission for Relativistic Tests around the Earth". In: *Thirteenth Marcel Grossmann Meeting: On Recent Developments in Theoretical and Experimental General Relativity, Astrophysics and Relativistic Field Theories*. Ed. by K. Rosquist, pp. 2372–2374.
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- 2014 Bertone, S., A. Vecchiato, C. Le Poncin-Lafitte, M. Crosta, and L. Bianchi. "Latest advances in an astrometric model based on the Time Transfer Functions formalism". In: *Journées 2013 "Systèmes de référence spatio-temporels"*. Ed. by N. Capitaine, pp. 16–19. arXiv: 1401.1366 [gr-qc].
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- 2014 Qi, Z., Y. Yu, R. L. Smart, M. G. Lattanzi, Z. Tang, B. Bucciarelli, A. Vecchiato, A. Spagna, and B. J. McLean. "Absolute Proper Motions Outside the Plane (APOP)". In: *Symposium S293 (Formation, Detection, and Characterization of Extrasolar Habitable Planets)*. Ed. by N. Haghighipour. Vol. 8. Proceedings of the International Astronomical Union, pp. 413–415.
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- 2013 Bertone, S., C. Le Poncin-Lafitte, M. Crosta, A. Vecchiato, O. Minazzoli, and M.-C. Angonin. "Relativistic models for Gaia at the (cross)check-point". In: *SF2A-2013: Proceedings of the Annual meeting of the French Society of Astronomy and Astrophysics*. Ed. by L. Cambresy, F. Martins, E. Nuss, and A. Palacios, pp. 155–159.
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- 2012 Abbas, U., A. Vecchiato, B. Bucciarelli, M. G. Lattanzi, and R. Morbidelli. "Astrometric Sphere Reconstruction in Gaia: Challenges and First Results of the Verification Unit". In: *Twelfth Marcel Grossmann Meeting on General Relativity*, p. 1529.
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- 2012 Vecchiato, A. "Putting Einstein to test. Astrometric experiments in fundamental physics". In: *Mem. SAIt* 83, p. 1073.
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- 2011 Abbas, U., A. Vecchiato, B. Bucciarelli, M. G. Lattanzi, and R. Morbidelli. "Global Sphere Reconstruction in the Astrometric Verification Unit". In: *EAS Publications Series*. Vol. 45. EAS Publications Series, pp. 127–132.
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- 2011 Gai, M., A. Vecchiato, A. Sozzetti, S. Ligori, and M. G. Lattanzi. "Gravitation Astrometric Measurement Experiment (GAME)". In: *Symposium S276 (The Astrophysics of Planetary Systems: Formation, Structure, and Dynamical Evolution)*. Ed. by A. Sozzetti, M. G. Lattanzi, and A. P. Boss. Vol. 6. Proceedings of the International Astronomical Union, pp. 535–536.

2011

Martino, M., A. Ciampolini, R. Messineo, A. Mulone, E. Pigozzi, V. Icardi, F. Solitro, M. M. Castronuovo, M. G. Lattanzi, R. Morbidelli, R. Drimmel, M. Sarasso, D. Busonero, M. Crosta, D. Gardiol, and A. Vecchiato. "The Italian contribution to the Gaia data processing and archiving". In: *Symposium S276 (The Astrophysics of Planetary Systems: Formation, Structure, and Dynamical Evolution)*. Ed. by A. Sozzetti, M. G. Lattanzi, and A. P. Boss. Vol. 6. Proceedings of the International Astronomical Union, pp. 539–541.

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Busonero, D., A. Riva, M. Gai, M. T. Crosta, A. Vecchiato, and M. G. Lattanzi. "Localizing Evidence of Gravitational waves by Observations of Light source Astrometric Signature: LEGOLAS". In: *38th COSPAR Scientific Assembly*. Vol. 38. COSPAR Meeting, p. 3826.

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Gai, M., A. Vecchiato, M. G. Lattanzi, S. Ligorì, D. Loreggia, and S. Fineschi. "Gamma astrometric measurement experiment -science and implementation". In: *38th COSPAR Scientific Assembly*. Vol. 38. COSPAR Meeting, p. 3824.

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Vecchiato, A., G. Bernardi, and M. Gai. "Measurement of the PPN- $\beta$  parameter in the GAME mission." In: *38th COSPAR Scientific Assembly*. Vol. 38. COSPAR Meeting, p. 3840.

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Vecchiato, A., M. Gai, P. Donati, R. Morbidelli, M. G. Lattanzi, and M. Crosta. "GAME - A small mission concept for high-precision astrometric test of General Relativity". In: *Highlights of Astronomy* 15, pp. 325–325.

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Crosta, M. and A. Vecchiato. "Proper stellar directions and astronomical aberration". In: *Symposium S261 (Relativity in Fundamental Astronomy: Dynamics, Reference Frames, and Data Analysis)*. Ed. by S. A. Klioner, P. K. Seidelmann, and M. H. Soffel. Vol. 5. Proceedings of the International Astronomical Union, pp. 130–134.

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Vecchiato, A., U. Abbas, B. Bucciarelli, M. G. Lattanzi, and R. Morbidelli. "Global astrometric sphere reconstruction in Gaia: challenges and first results of the Verification Unit". In: *Symposium S261 (Relativity in Fundamental Astronomy: Dynamics, Reference Frames, and Data Analysis)*. Ed. by S. A. Klioner, P. K. Seidelmann, and M. H. Soffel. Vol. 5. Proceedings of the International Astronomical Union, pp. 337–341.

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- 2008  
Crosta, M. T., B. Bucciarelli, F. de Felice, M. G. Lattanzi, and A. Vecchiato. "Astrometric observable and relativistic astrometric catalogues". In: *EAS Publications Series*. Ed. by A. Oscoz, E. Mediavilla, and M. Serra-Ricart. Vol. 30. EAS Publications Series, pp. 345–348.
- 2008  
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- 2008  
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- 2008  
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- 2008  
Vecchiato, A., B. Bucciarelli, M. T. Crosta, M. G. Lattanzi, G. Preti, and F. de Felice. "Relativistic Astrometry with GAIA Advances in the Ramod Project". In: *The Eleventh Marcel Grossmann Meeting On Recent Developments in Theoretical and Experimental General Relativity, Gravitation and Relativistic Field Theories*. Ed. by H. Kleinert, R. T. Jantzen, and R. Ruffini, pp. 2543–2545.
- 2008  
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- 2008  
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- 2008  
Vecchiato, A., M. G. Lattanzi, M. Gai, and R. Morbidelli. "Gamma Astrometric Measurement Experiment: testing General Relativity with a small mission". In: *Symposium S248 (A Giant Step: from Milli- to Micro-arcsecond Astrometry)*. Ed. by W. J. Jin, I. Platais, and M. A. C. Perryman. Vol. 3. Proceedings of the International Astronomical Union, pp. 290–291.



- 2005  
Bernardi, G., B. Bucciarelli, W. Ferreri, M. G. Lattanzi, R. Morbidelli, R. Pannunzio, R. L. Smart, and A. Vecchiato. "In Viaggio Fra le Stelle: The making of the GSC II". In: *In IAU Commission 55: Communicating Astronomy with the Public 2005*. Ed. by I. Robson and L. L. Christensen, pp. 292–294.
- 2005  
Bini, D., B. Bucciarelli, M. T. Crosta, M. G. Lattanzi, A. Vecchiato, and F. de Felice. "Relativistic satellite attitude: joining local and global reference frames for the realization of space-borne astrometric catalogues". In: *Highlights of Astronomy* 13, p. 614.
- 2005  
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- 2003  
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Vecchiato, A. "Relativistic Satellite Astrometry". In: *The Ninth Marcel Grossmann Meeting*. Ed. by V. G. Gurzadyan, R. T. Jantzen, and R. Ruffini, pp. 1795–1796.
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- 1997  
de Felice, F., M. G. Lattanzi, A. Vecchiato, and P. L. Bernacca. "A Relativistic Model for the GAIA Observations". In: *Hipparcos - Venice '97*. Ed. by R. M. Bonnet, E. Høg, P. L. Bernacca, L. Emiliani, A. Blaauw, C. Turon, J. Kovalevsky, L. Lindegren, H. Hassan, M. Bouffard, B. Strim, D. Heger, M. A. C. Perryman, and L. Woltjer. Vol. 402. ESA Special Publication, pp. 767–770.

## Technical reports

- 2015  
Vecchiato, A., U. Abbas, and L. Bianchi. *GSR 17.0 Software Release Note*. Tech. rep. GAIA-C3-TR-INAF-AVE-024-01. Gaia DPAC.
- 2014  
Vecchiato, A., U. Abbas, and L. Bianchi. *GSR 16.0 Software Test Report*. Tech. rep. GAIA-C3-TR-INAF-AVE-023-01. Gaia DPAC.
- 2013  
Vecchiato, A., U. Abbas, and L. Bianchi. *GSR 14.0 Software Release Note*. Tech. rep. GAIA-C3-TR-INAF-AVE-021-01. Gaia DPAC.
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Riva, A., M. Gai, and A. Vecchiato. *ISAS Optical Design Report*. Tech. rep. 156. INAF- OATo.
- 2012  
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