

***Selected Publications as of March, 2010**

1. S. Nihonyanagi, S. Yamaguchi and T. Tahara, "Direct evidence for orientational flip-flop of water molecules at charged interfaces: a heterodyne-detected VSFG study," *J. Chem. Phys.*, 130, 204704-1 – 204704-5 (2009). [[full text](#)]
2. S. Takeuchi, S. Ruhman, T. Tsuneda, M. Chiba, T. Taketsugu, and T. Tahara: "Spectroscopic tracking of structural evolution in ultrafast stilbene photoisomerization", *Science*, 322, 1073-1077 (2008). [[full text](#)]
3. S. Yamaguchi and T. Tahara, "Heterodyne-Detected Electronic Sum Frequency Generation: "Up" vs. "down" alignment of interfacial molecules," *J. Chem. Phys.*, 129(10), 101102-1 – 101102-4 (2008). [[full text](#)]
4. K. Sekiguchi, S. Yamaguchi and T. Tahara, "Femtosecond time-resolved electronic sum-frequency generation (TR-ESFG) spectroscopy: A new method to investigate ultrafast dynamics at liquid interfaces", *J. Chem. Phys.*, 128(11), 114715-1 – 114715-8 (2008). [[full text](#)]
5. M. Iwamura, S. Takeuchi and T. Tahara: "Real-time observation of the photoinduced structural change of bis-2,9-dimethyl-1,10-phenanthroline copper (I) by femtosecond fluorescence spectroscopy: A realistic potential curve of the Jahn-Teller distortion", *J. Am. Chem. Soc.*, 129(16), 5248-5256 (2007). [[full text](#)]
6. S. Takeuchi and T. Tahara, "The answer to concerted versus step-wise controversy for the double proton transfer mechanism of 7-azaindole dimer in solution", *Proc. Natl. Acad. Sci. USA*, 104(13), 5285-5290 (2007). [[full text](#)]
7. T. Fujino, T. Fujima and T. Tahara, "Femtosecond fluorescence dynamics imaging using fluorescence up-conversion microscope", *J. Phys. Chem. B*, 109(32), 15327-15331 (2005). [[full text](#)]
8. T. Horio, T. Fuji, Y. Suzuki, and T. Suzuki: "Probing ultrafast internal conversion through conical intersection via time-energy map of photoelectron angular anisotropy", *J. Am. Chem. Soc.*, 131(30), 10392–10393 (2009). [[full text](#)]
9. T. Horio and T. Suzuki: "Multihit two-dimensional charged-particle imaging system with real-time image processing at 1000 frames/s", *Rev. Sci. Instrum.*, 80, 013706 (2009). [[full text](#)]
10. T. Fuji, T. Horio, and T. Suzuki: "Generation of 12-fs deep ultraviolet pulses by four-wave mixing through filamentation in neon gas", *Optics Letters*, 32, 2481 (2007). [[full text](#)]

List of publications (Apr. 2005 – Mar. 2011)

1. M. Iwamura, H. Watanabe, K. Ishii, S. Takeuchi, and T. Tahara: "Coherent nuclear dynamics in ultrafast photoinduced structural change of bis-diimine copper (I) complex", *J. Am. Chem. Soc.* in press.
2. Z. R. Wei, T. Nakamura, S. Takeuchi, and T. Tahara: "Tracking of the nuclear wavepacket motion in cyanine photoisomerization by ultrafast pump-dump-probe spectroscopy", *J. Am. Chem. Soc.* in press.
3. S. Y. Liu, Y. Ogi, T. Fuji, K. Nishizawa, T. Horio, T. Mizuno, H. Kohguchi, M. Nagasono, T. Togashi, K. Tono, M. Yabashi, Y. Senba, H. Ohashi, H. Kimura, T. Ishikawa, and T. Suzuki, "Time-resolved photoelectron imaging using a femtosecond UV laser and VUV free-electron laser", *Physical Review A rapid communication*, 81, 031403/1-4 (2010).
4. A. Jha, K. Ishii, J. Udgaonkar, T. Tahara, G. Krishnamoorthy: "Exploration of the correlation between solvation dynamics and internal dynamics of a protein", *Biochemistry* 50, 397-408 (2011).
5. S. K. Mondal, S. Yamaguchi, and T. Tahara: "Molecules at the air/water interface experience more inhomogeneous solvation environment than in bulk solvents, A quantitative bandshape analysis of interfacial electronic spectra obtained by HD-ESFG", *J. Phys. Chem. C* 115, 3083-3089 (2011).
6. P. Sen, S. Yamaguchi and T. Tahara: "Ultrafast dynamics of malachite green at the air/water interface studied by femtosecond time-resolved electronic sum-frequency generation (TR-ESFG): An indicator for local viscosity", *Faraday Discussion* 145, 411-428 (2010).
7. S. Nihonyanagi, S. Yamaguchi, and T. Tahara: "Water hydrogen bond structure near highly charged

- interfaces is not like ice”, *J. Am. Chem. Soc.* 132, 6867-6869 (2010).
8. J. A. Mondal, S. Nihonyanagi, S. Yamaguchi, and T. Tahara: “Structure and orientation of water at charged lipid monolayer/water interfaces probed by heterodyne-detected vibrational sum frequency generation spectroscopy”, *J. Am. Chem. Soc.* 132, 10656-10657 (2010).
 9. K. Ishii and T. Tahara: “Resolving inhomogeneity using lifetime-weighted fluorescence correlation spectroscopy”, *J. Phys. Chem. B* 144, 12383-12391 (2010).
 10. Y. Tang, Y. Suzuki, T. Horio, and T. Suzuki, "Molecular Frame Image Restoration and Partial Wave Analysis of Photoionization Dynamics of NO by Time-Energy Mapping of Photoelectron Angular Distribution", *Phys. Rev. Lett.*, 104, 073002, (2010)
 11. K. Nakashima, T. Nakamura, S. Takeuchi, M. Shibata, M. Demura, T. Tahara, and H. Kandori, "Property of anion binding site of pharaonis Halorhodopsin studied by ultrafast pump-probe spectroscopy and low-temperature FTIR spectroscopy", *J. Phys. Chem. B.*, 113, 8429-8434 (2009).
 12. J. K. Klosterman, M. Iwamura, T. Tahara and M. Fujita: “Host-guest energy transfer in a mechanically trapped exciplex,” *J. Am. Chem. Soc.*, 131(4), 9478 -9479 (2009).
 13. K. Ishii, S. Takeuchi and T. Tahara: “Mid-IR-induced nuclear wavepacket motion of a hydrogen bonding system: Effects of mechanical and electrical anharmonic couplings,” *J. Chem. Phys.*, 131. 044512/1-044512/9 (2009).
 14. T. Horio, T. Fuji, Y. Suzuki, and T. Suzuki: “Probing Ultrafast Internal Conversion through Conical Intersection via Time-Energy Map of Photoelectron Angular Anisotropy”, *J. Am. Chem. Soc.*, 131(30), 10392–10393 (2009).
 15. K. Ono, J. K. Klosterman, M. Yoshizawa, K. Sekiguchi, T. Tahara, and M. Fujita: “ON/OFF red emission from azaporphine in an organometallic host in water,” *J. Am. Chem. Soc.*, 131(35) 12526-12527 (2009).
 16. S. Nihonyanagi, S. Yamaguchi and T. Tahara, “Direct evidence for orientational flip-flop of water molecules at charged interfaces: a heterodyne-detected VSG study,” *J. Chem. Phys.*, 130, 204704-1 – 204704-5 (2009).
 17. T. Sakamaki, T. Fujino, H. Hosoi, T. Tahara, and T. Korenaga: "Picosecond time-resolved fluorescence study of poly vinyl methyl ether aqueous solution", *Chem. Phys. Lett.*, 468, 171-175 (2009).
 18. D. Mandal, H. Hosoi, U. Chatterjee, and T. Tahara: "Direct observation of time-dependent photoluminescence spectral shift in CdS nanoparticles synthesized in polymer solutions", *J. Chem. Phys.*, 130, 034902-1 - 034902-8 (2009).
 19. T. Horio and T. Suzuki, "Multihit two-dimensional charged-particle imaging system with real-time image processing at 1000 frames/s", *Rev. Sci. Instrum.* 80, 013706 (2009).
 20. H. Hiyoshi, T. Aoyama, T. Wada, T. Sonoda, and S. Mataka, “Synthesis and Properties of Disk-shaped Bipolar Symmetric Cyclic Triindole Derivative”, *Heterocycles*, 77, 596-602 (2009).
 21. M. Kawamoto, T. Aoki, N. Shiga, and T. Wada, “Thermo and Photoresponsive Behavior of Liquid-crystalline Helical Structures with the Aid of Dual Molecular Motions”, *Chem. Mat.*, 21, 564-572 (2009).
 22. S. Takeuchi, S. Ruhman, T. Tsuneda, M. Chiba, T. Taketsugu, and T. Tahara: "Spectroscopic tracking of structural evolution in ultrafast stilbene photoisomerization", *Science*, 322, 1073-1077(2008).
 23. S. Yamaguchi and T. Tahara: "Coherent acoustic photons in a thin gold film probed by femtosecond surface plasmon resonance", *J. Raman Spectrosc.*, 39, 1703-1706 (2008).
 24. T. Nakamura, S. Takeuchi, M. Shibata, M. Demura, H. Kandori, and T. Tahara, “Ultrafast pump-probe study of primary photoreaction dynamics in *pharaonis* halorhodopsin: Halide-ion dependence and isomerization dynamics”, *J. Phys. Chem. B* , 112(40), 12795-12800 (2008).
 25. S. Yamaguchi and T. Tahara: "Heterodyne-detected electronic sum frequency generation: “Up” vs. “down” alignment of interfacial molecules”, *J. Chem. Phys.*, 129, 101102-1 – 101102-4 (2008).
 26. T. Sakamaki, T. Fujino, H. Hosoi, T. Tahara, and T. Korenaga: "Solvation structure on polyacrylamide fine particle surface studied by picoseconds time-resolved fluorescence spectroscopy", *Chem Lett.*, 37, 980-981 (2008).
 27. P. Sen, S. Yamaguchi, and T. Tahara: "New insight into the surface denaturation of a protein: An electronic sum frequency generation study", *J. Phys. Chem. B.*, 112, 13473-13475 (2008).
 28. T. Nakamura, S. Takeuchi, N. Suzuki and T. Tahara: "Revised steady-state fluorescence spectra and nature of the reactive S₁ state of cis-stilbene in solution", *Chem. Phys. Lett.*, 465, 212-215 (2008).
 29. T. Fujino, K. Hirota, K. Ohta, and T. Tahara: "In-cell viscosity measurement using a fluorescence up-conversion microscope", *Chem. Lett.*, 37, 1240-1241 (2008).
 30. Y. Suzuki and T. Suzuki: "Photoelectron angular distribution in valence shell ionization of heteroatomic molecules studied by continuum multiple scattering X α method", *J. Phys. Chem. A*, 112 402-412 (2008).
 31. M. Oku, Y. Hou, X. Xing, B. Reed, H. Xu, C. Chang, C. Y. Ng, K. Nishizawa, K. Ohshimo, and T. Suzuki: "3s Rydberg and Cationic States of Pyrazine Studied by Photoelectron Spectroscopy", *J. Phys. Chem. A*, 112, 2293-2310 (2008).

32. U. Werner, R. Mitric, T. Suzuki, and V. Bonacic-Koutecky: "Nonadiabatic dynamics within the time dependent density functional theory: Ultrafast photodynamics in pyrazine", *Chem. Phys.*, 349, 319-324 (2008).
33. Y. Suzuki: "Direct relation of molecular orbital symmetry with photoelectron angular distributions from aligned molecules in the gas phase", *J. Phys. B: At. Mol. Opt. Phys.* 41, 215204 (2008).
34. S. Ikeda, H. Kumagai, H. Ooi, K. Konishi, H. Hiyoshi, and T. Wada, "Precise Determination of the First Hyperpolarizability of a Fluorescent Triindole Derivative with Dicyanovinyl Groups by the Deconvolution Method", *Chem. Phys. Lett.*, 458, 337-340 (2008).
35. K. ISHII, S. TAKEUCHI and T. TAHARA, "Pronounced non-Condon effect as the origin of quantum beat observed in time-resolved absorption signal from excited-state cis-stilbene," *J. Phys. Chem. A.*, 112(11), 2219-2227 (2008).
36. K. SEKIGUCHI, S. YAMAGUCHI, and T. TAHARA, "Femtosecond time-resolved electronic sum-frequency generation (TR-ESFG) spectroscopy: A new method to investigate ultrafast dynamics at liquid interfaces", *J. Chem. Phys.* 128, 114715-1 – 114715-8 (2008).
37. H. HOSOI, S. YAMAGUCHI, H. MIZUNO, A. MIYAWAKI and T. TAHARA, "Hidden electronic state of enhanced green fluorescence protein", *J. Chem. Phys. B*, 112, 2761-2763 (2008).
38. T. NOMOTO, H. HOSOI, T. FUJINO, T. TAHARA, and H. HAMAGUCHI, "The excited-state structure and the dynamics of 1,3,5-tris(phenylethynyl)benzene as studied by Raman and time-resolved fluorescence spectroscopy", *J. Phys. Chem. A.*, 111(15), 2907-2912 (2007).
39. S. YAMAGUCHI and T. TAHARA, " $\chi^{(4)}$ Raman spectroscopy for buried water interfaces", *Angew. Chem. Int. Ed.* 46, 7609-7612 (2007).
40. T. FUJI, T. HORIO and T. SUZUKI, "Generation of 12-fs deep-ultraviolet pulses by four-wave mixing through filamentation in neon gas", *Opt. Lett.*, 17, 2481-2483 (2007).
41. T. FUJI and T. SUZUKI, "Generation of sub-two-cycle mid-infrared pulses by four-wave mixing through filamentation in air", *Opt. Lett.*, 22, 3330-3332 (2007).
42. Y. SUZUKI and T. SUZUKI, "Determination of ionization dynamical parameters by time-resolved photoelectron imaging," *Molecular Physics*, 105, 1675-1693 (2007).
43. M. HORIE, T. SASSA, D. HASHIZUME, Y. SUZAKI, K. OSAKADA and T. WADA, "A crystalline supramolecular switch: controlling the optical anisotropy through the collective dynamic motion of molecules", *Angew. Chem. Int. Ed.*, 46, 4983-4986 (2007).
44. J. GU, W.-C. CHEN, T. WADA, D. HASHIZUME and X.-M. DUAN, "From supermolecular sheet to helix via breaking molecular symmetry: a case of 4-[2-(Carbazol-3-yl)vinyl]pyridium tosylate", *Cryst. Eng. Comm.*, 9, 541-544 (2007).
45. J. C. RIBIERRE, T. AOYAMA, T. KOBAYASHI, T. SASSA, T. MUTO and T. WADA, "Influence of the liquid carbazole concentration on charge trapping in C₆₀ sensitized photorefractive polymers", *J. Appl. Phys.*, 102, 033106-1 - 033106-5 (2007).
46. T. FUJIHARA, T. SASSA, Y. TAKEDA, T. MUTO, T. WADA and S. UMEGAKI, "Optimization of thickness of polymeric photorefractive thin film for large two-beam coupling strength in reflection beam arrangement", *Jpn. J. Appl. Phys.*, 46 (7A), 4160-4162 (2007).
47. T. AOYAMA, Y. FUKUCHI, T. YAMASHITA and T. WADA, "Grating formation by periodic photopolymerization in organic photovoltaic devices", *J. Photopolym. Sci. Technol.*, 20 (1), 93-95 (2007).
48. T. WADA, T. FUJIHARA, T. MUTO and J. GU, "Development of noncontact thermal rewritable system using laser light", *J. Photopolym. Sci. Technol.*, 20 (4), 529-531 (2007).
49. M. KAMOWATO, T. AOKI and T. WADA, "Photoinduced twisting behavior of chiral cyclic compounds", *Proc. SPIE*, 6653, 66530K-1-8 (2007).
50. T. KONISHI, M. HORIE, T. WADA, S. OGASAWARA, J. KIKUCHI and A. IKEDA, "Supramolecular photocurrent-generating systems using porphyrin composite materials", *J. Porphyrin Phthalocyanine*, 11 (5), 342-347 (2007).
51. S. TAKEUCHI and T. TAHARA, "The answer to concerted versus step-wise controversy for double proton transfer mechanism of 7-azaindole dimer in solution", *Proc. Natl. Acad. Sci. USA*, 104, 5285-5290 (2007).
52. M. IWAMURA, S. TAKEUCHI and T. TAHARA, "Real-time observation of the photoinduced structural change of bis-2,9-dimethyl-1,10-phenanthroline copper (I) by femtosecond fluorescence spectroscopy: A realistic potential curve of the Jahn-Teller distortion", *J. Am. Chem. Soc.*, 129, 5248-5256 (2007).
53. D. NANJO, H. HOSOI, T. FUJINO, T. TAHARA, T. KORENAGA, "Femtosecond/picosecond time-resolved fluorescence study of hydrophilic polymer fine particles", *J. Phys. Chem. B*, 111, 2759 - 2764 (2007).
54. M. KAWAMOTO, T. AOKI and T. WADA, "Light-driven Twisting Behavior of Chiral Cyclic Compounds", *Chem. Commun.*, 930-932 (2007).
55. T. Suzuki: "Femtosecond time-resolved photoelectron imaging study of photoinduced molecular dynamics", *Journal of the Chinese Chemical Society*, 53, 113-122 (2006).

56. T. TAHARA, TAKEUCHI and K. ISHII, "Observation of nuclear wavepacket motion of reacting excited states in solution", *Journal of the Chinese Chemical Society*, 53, 181-189 (2006).
57. S. SHIMOZONO, H. HOSOI, H. MIZUNO, T. FUKANO, T. TAHARA, and A. MIYAWAKI, "Concatenation of cyan and yellow fluorescence proteins efficient resonance energy transfer", *Biochemistry*, 45, 6267 (2006).
58. Y. KIKUZAWA, T. NAGATA, T. TAHARA, and K. ISHII, "Photo- and Redox Active Dendritic Molecules with soft, Layered Nanostructures", *Chem. Asian J.* 1, 516-528 (2006).
59. H. HOSOI, H. MIZUNO, A. MIYAWAKI, and T. TAHARA, "Competition between energy and proton transfer in ultrafast excited-state dynamics of an oligomeric fluorescence protein red Kaede", *J. Phys. Chem. B*, 110, 22853-22860 (2006).
60. S. YAMAGUCHI and T. TAHARA, "Determining electronic spectra at interfaces by electronic sum frequency generation (ESFG): One- and two-photon double resonant oxazine 750 at the air/water interface", *J. Chem. Phys.*, 125, 194711-194718 (2006).
61. H. KOHGUCHI and T. SUZUKI, "A crossed molecular beam imaging study of the $O(^1D_2) + HCl \rightarrow OH + Cl(^2P_{J=3/2, 1/2})$ reaction", *ChemPhysChem*, 7, 1250 (2006).
62. H. KAWAMATA, H. KOHGUCHI, T. NISHIDE, and T. SUZUKI, "Photodissociation of Nitrous Oxide starting from excited bending levels", *J. Chem. Phys.*, 125, 133312 (2006).
63. K. ISHII, S. TAKEUCHI and T. TAHARA, "A 35-fs time-resolved absorption study of all-trans retinal in a nonpolar solvent: ultrafast photophysics revisited", *Chem. Phys. Lett.*, 418, 307-310 (2006).
64. K. SEKIGUCHI, S. YAMAGUCHI, and T. TAHARA, "Formation and dissociation of rhodamine 800 dimers in water: Steady-state and ultrafast spectroscopic study", *J. Phys. Chem. A*, 110, 2601-2606 (2006).
65. MANDAL, M. MIZUNO and T. TAHARA, "Temporal fluorescence rejection in Raman spectroscopy using femtosecond up-conversion technique in the single- and multichannel detection modes", *J. Mol. Struct.*, 735-736, 189-195 (2005).
66. H. HOSOI, S. YAMAGUCHI and T. TAHARA, "Host to guest energy transfer in a self-assembled supramolecular nanocage observed by picosecond fluorescence quenching", *Chem. Lett.*, 34, 618 (2005).
67. M. MIZUNO, S. YAMAGUCHI and T. TAHARA, "Relaxation dynamics of the nonequilibrated hydrated electron: Femtosecond time-resolved resonance Raman, luminescence and absorption studies", *J. Phys. Chem. A*, 109, 5257-5265 (2005).
68. T. FUJINO, T. FUJIMA and T. TAHARA, "Femtosecond fluorescence dynamics imaging using fluorescence up-conversion microscope", *J. Phys. Chem. B*, 109, 15327-15331 (2005).
69. T. FUJINO, T. FUJIMA and T. TAHARA, "Picosecond time-resolved fluorescence imaging by non-scanning Kerr gate microscopy", *Appl. Phys. Lett.*, 87, 131105-131107 (2005).
70. S. TAKEUCHI and T. TAHARA, "Coherent nuclear wavepacket motions in ultrafast excited-state intramolecular proton transfer: Sub-30-fs resolved pump-probe spectroscopy of 10-hydroxybenzo[h]quinoline in solution", *J. Phys. Chem. A*, 109, 10199-10207 (2005).
71. M. TSUBOUCHI, C. A. deLANGE and T. SUZUKI, "Ultrafast dissociation processes in the NO dimer studied with time-resolved photoelectron imaging", *Journal of Electron Spectroscopy and Related Phenomena*, 142, 193-205 (2005).
72. M. TSUBOUCHI and T. SUZUKI, "Photoionization of homo-nuclear diatomic molecules aligned by an intense femtosecond laser pulse", *Physical Review A*, 72, 022512 (2005).
73. 堀江正樹、佐々高史、橋爪大輔、和田達夫、"結晶中で動く、光を操る超分子スイッチ"、*未来材料*、7 (4), 40-45 (2007).
74. 和田達夫、"エレクトロニクスからフォトニクスへ -多機能性超分子への期待-"、*Polyfile*, 44 (523), 22-27 (2007).
75. 青山哲也、渡邊 智、福地康正、渡邊 剛、佐々高史、山下 俊、松本睦良、和田達夫、"有機光電変換素子の構造化と表面電位イメージング"、*Molecular Electronics and Bioelectronics*, 19, 75-76 (2008).

Books, Proceedings

1. T. Fujino and T. Tahara, "Ultrafast Fluorescence Microscopes", Chapter 3 (pp. 51-70) In *Biochemical Application of Nonlinear Optical Spectroscopy*, ed. Vladislav Yakovlev, CRC Press, (2009)
2. S. YAMAGUCHI and T. TAHARA, "Novel interface-selective even-order nonlinear spectroscopy", *Laser & Photonics Reviews*, 2, 74-82 (2008).
3. T. SUZUKI, "Femtosecond time-resolved photoelectron imaging", *Annual Review of Physical Chemistry*, 57, 555-592 (2006).

4. 田原太平: “界面選択的非線形分光法”、新しい局面を迎えた界面の分子科学 Part II 4章 (pp. 113-121)、日本化学会編、化学同人 (2011).
5. 田原太平: “II-2-3-5偶数次非線形分光”、現代界面コロイド科学の事典ーシャンプーから宇宙まで、丸善. (2010). 細井晴子、山口祥一、田原太平、“超短パルスを用いた先端的分光計測による蛍光タンパク質の発光機構の研究”、レーザー研究、37, 734-738 (2009).
6. 竹内佐年、田原太平、“シス-スチルベンの超高速光異性化ダイナミクス：これまでの研究経緯と新たな展開”、光化学、40, 9 (2009).
7. 鈴木俊法、染田清彦 訳、R. D. レヴィン 著、「分子反応動力学」、シュプリンガー・ジャパン、2009年3月.
8. 堀尾琢哉、鈴木俊法、「超高速光電子分光による化学反応のリアルタイム観測」, ナノイメージング, (エヌ・ディー・エス, 東京), pp.321-330 (2008)
9. 山口祥一、田原太平、“界面を観る新しい偶数次非線形分光”、分光研究、57(4), 168 -178 (2008).
10. 山口祥一、田原太平、“界面を選択的に観測する偶数次非線形分光”、バイオインダストリー、25、5-12 (2008).
11. 山口祥一、田原太平、“‘埋もれた’ 界面に光を当てるー電子和周波発生と四次非線形ラマン分光で界面を見る”、化学、63、18-23(2008).
12. 藤野竜也、田原太平、“アゾベンゼンの超高速光異性化メカニズム”、高分子、56、488-492 (2007).
13. 山口祥一、田原太平、“新しい界面選択的な偶数次非線形分光”、表面科学、28、682-687 (2007).