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Autore	Nishi Takanori
Titolo	Photoelectron-Ion Correlation in Photoionization of a Hydrogen Molecule and Molecule-Photon Dynamics in a Cavity // by Takanori Nishi
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Nota di contenuto	1. General introduction -- 2. Entanglement and coherence created by photoionization of H <sub>2</sub> -- 3. Time delay in the coherent vibrational motion of H <sub>2</sub> <sup>+</sup> created by photoionization of H <sub>2</sub> -- 4. Molecule in a plasmonic nanocavity -- 5. Summary and outlook -- 6. Appendices. .
Sommario/riassunto	This book presents the latest theoretical studies giving new predictions and interpretations on the quantum correlation in molecular dynamics induced by ultrashort laser pulses. The author quantifies the amount of correlation in terms of entanglement by employing methods developed in quantum information science, in particular applied to the photoionization of a hydrogen molecule. It is also revealed that the photoelectron–ion correlation affects the vibrational dynamics of the

molecular ion and induces the attosecond-level time delay in the molecular vibration. Furthermore, the book also presents how molecular vibration can couple to photons in a plasmonic nanocavity. Physicists and chemists interested in the ultrafast molecular dynamics would be the most relevant readers. They can learn how we can employ the quantum-information-science tools to understand the correlation in the molecular dynamics and why we should consider the correlation between the photoelectron and the molecular ion to describe the ion's dynamics. They can also learn how to treat a molecule coupled to photons in a nanocavity. All the topics are related to the state-of-the-art experiments, and so, it is important to publish these results to enhance the understanding and to induce new experiments to confirm the theory presented. .

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