

Coherence of Nonlinear Process

Shen Lei¹

Shanghai Institute of Applied Physics, Chinese Academy of Sciences, 2019 Jia Luo Road, Jiading District, Shanghai, 201800, P.R. China,

Synopsis Except for the coherence of the laser, coherence of nonlinear process is also a very important thing to be considered in the research of the interaction between radiation and materials. Theoretical research was focused on it. Interference characterization is used to prove the coherence property. The results have some properties as vortex beam.

Coherence is very important property to characterize the radiation pulse. In the history, there are quite a lot of works on Laser and coherence spectroscopy [1], coherence phenomena in atoms and molecules in laser fields [2], which mainly describe the coherence of a narrow bandwidth pulse. With the development of the ultrafast laser, more works focus on the coherence and ultrashort pulse laser emission [3], which talks more about the coherence of a broad bandwidth pulse. Except for the stimulated radiation, nonlinear process is also a kind of phenomena occurred in the interaction between radiation and different materials. The coherence property of the nonlinear process should be a rather interesting thing to be considered.

In this paper, theoretical research was focused on the coherence of nonlinear process. Under different phase match condition, different temporal pulse properties can be produced [4]. To characterize these temporal pulse properties, interference

characterization is used to get the different interference pattern to prove the coherence of the nonlinear process, which also have some properties as vortex beam.

References

- [1] Laser and Coherence Spectroscopy, J. I. Steinfeld, Plenum Press, New York, 1978
- [2] Coherence Phenomena in Atoms and Molecules in Laser Fields, A. D. Bandrauk, S.C. Wallace, Proceedings of a NATO Advanced Research Workshop on Coherence Phenomena in Atoms and Molecules in Laser Fields, Hamilton, Ontario, Canada, 1991
- [3] Coherence and Ultrashort Pulse Laser Emission, F.J. Duarte, InTech, Croatia, 2010
- [4] Temporal synchronization by pre-chirp control in broadband noncollinear optical parametric amplifier, Lei Shen, et al., UFO VII/HFSW XIII, post Deadline Session, Arcachon, France, 2009

错误! 未找到引用源。 E-mail:
lshen730330@msn.com