Comments and Suggestions

The manuscript entitled 'Period Doubling route to chaos in Photorefractive Two Wave Mixing' is very well-written, and the author has established a very clear framework. This manuscript proposes to use the PR-TWM setting to control the generation of complex signals without any external feedback, making it much simpler than the existing system. It has certain significance for applications such as photon reservoir computing, material internal computing, and photon neuromorphic networks. In general, I think this is a manuscript that I recommend to publish after including minor revisions.

（1）In the phenomenon shown in Figure 2, what caused the energy exchange between two beams of light? Why is there a 90-degree phase difference between the irradiation pattern and the produced refractive index grating in space?

（2）In the results and discussions of the fourth part of the article, what kind of behavior does the intensity of the output signal show when a larger electric field is applied ? Does it show a clear periodicity ?