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Editorial Open Access

Single Eye 3D Imaging Perception Model

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Editorial

Generally, we have adopted the idea that in order for people to see three dimensional (3D) images in real life and at the movies two eyes are required, where in principle brain [1] reads the dual 2D imagery, which is converted it to 3D and connected to the optic nerves in brain. Humans can perceive depth when viewing with one eye, and even when viewing a two-dimensional picture of a three-dimensional scene. However, viewing a real scene with both eyes produces a more compelling three dimensional experience of immersive space and tangible solid objects. A widely held belief is that this qualitative visual phenomenon (stereopsis) is a by-product of binocular vision. In fact, stereopsis is a measurable qualitative attribute and that its induction while viewing pictures is not consistent with standard explanations based on depth-cue conflict or the perception of greater depth magnitude. These results challenge the conventional understanding of the underlying cause, variation, and functional role of stereopsis.

Nowadays the conventional thinking isn't quite right. Some researchers note that scientists and others have known for some time that viewing photographs through a small aperture provides some degree of 3D perception. But now there are some evidences that 3D images can be seen by only a single eye, especially, in the medical treatment case when the person who has only one eye left from accidence is recovered, in which the 3D image perception can be recovery after 3 year period [2], where this principle shows that the human perception is required sometime to adjust and tune to make the normal 3D image perception being realized. The concept of 3D imaging perception with a single eye has become the challenge for researchers, in which the seeking of confirmed principle in both theory and practice of such concept is the key target. Recently, Thammawongsa et al. [3] have pointed out that the 3D imaging perception can be realized by using a tiny device known as a PANDA ring resonator, in which the 3D images can be constructed by a nonlinear device called "conjugate mirror" and connected to the optics nerves in brain, where finally the 3D imaging perception can be established. Since key tools of the 3D perception are a conjugate mirror and life optic nerves, which they are in the form of two eye imaging system. It is the normal case of image construction, which is well described by the basic principle that the Whispering Gallery Mode (WGM) of light within the micro conjugate mirror can be used to construct the 3D image [4].

In this paper, we are pointing out that the use of such a tiny device, i.e. a PANDA ring resonator to form the required conjugate mirror function can make a single eye 3D imaging perception is plausible. From our experiences, the human single eye 3D imaging perception can be realized but it is required 3 year period for adjustment, which means that the use of a single conjugate mirror (artificial eye) may be possible. In Figure 1 and 2, the micro conjugate mirror using a microring device can be used to form a conjugate mirror, which is already well described in the past paragraph. In this technique, the double vision model can be arised by using two micro conjugate mirrors, where the single eye concept is obtained by using vertical fabrication. In operation, the model is embedded by the tiny fabricated semiconductor laser, the optical input from a laser is split and launched into both ring resonators (top and bottom) via the joint branches (coupling potrs), in which the WGMs of the resonant light beams can be formed by top and bottom ring resonators and the interference under the four wave mixing and nonlinear materials can be arised.

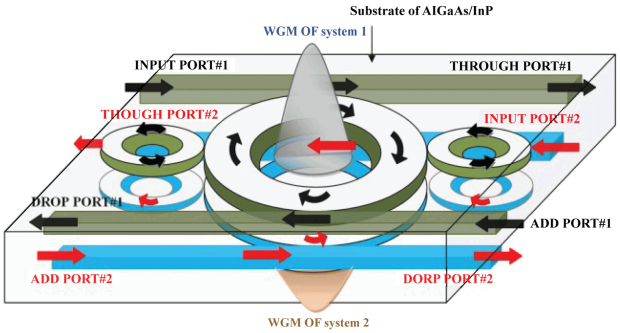

Figure 1: Double PANDA ring resonetors constructed by AlGaAs/InP material for single eye 3D imaging model

In operation, the top ring WGM light beam is projected to object and reflected back into the microring, the reference beam can be generated within the same ring, where the conjugate mirror is formed. The WGM light beams of the top and bottom rings can be formed and used for 3D image construction. The image adjustable can be arranged by using the bottom micro ring, i.e. conjugate mirror. Finally, the suitable condition is for 3D image obtained, the bottom WGMs light beam is now become 3D information that can be connected to the optics nerves, which means that the 3D imaging perception can be established by using a single eye, i.e. artificial eye.

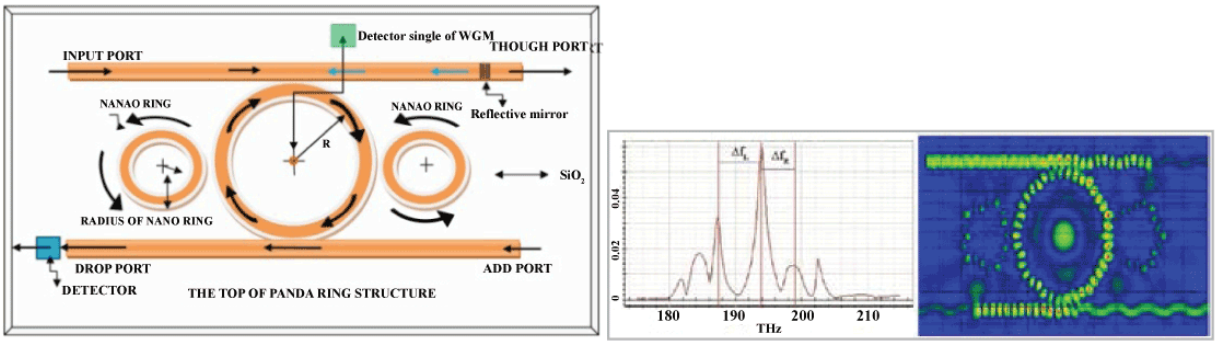

Figure 2a: Two micro conjugate mirrors using using AlGaAs/InP materials, where (a) Top ring

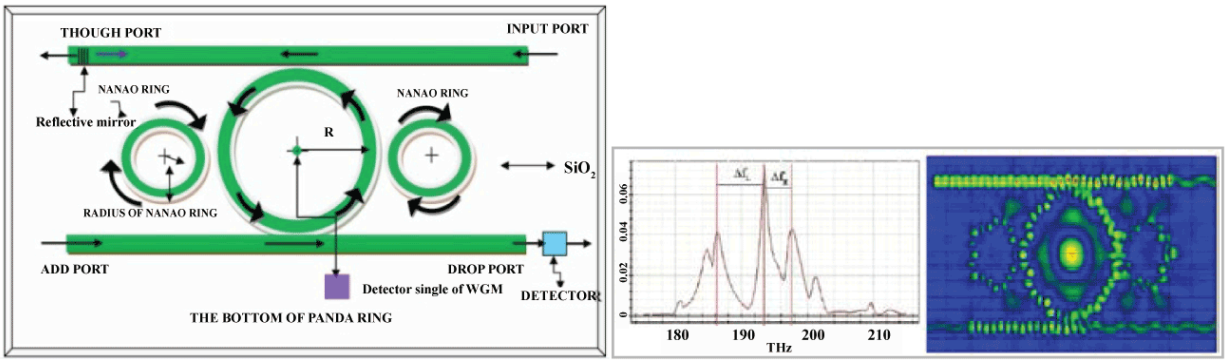

Figure 2b: Two micro conjugate mirrors using using AlGaAs/InP materials, where (b) Bottom ring with four waves mixing signals (bottom figure)

In conclusion, a single eye 3D imaging perception can be the device that can have a lot of changes in 3D imaging perception technologies, where there will be the key of researches and investigations, which can be involved in many applications. However, the impact between laser power and eye tissues is required to be aware for optic nerve safety, which will be the important issue for researches and investigations.

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