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## Quantum dot light emitting diode with optically filtered feedback

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We report a theoretical investigation on the optically filtered feedback (OFF) in a quantum dot light emitting diode. The underlying dynamics is affected by a side node. Both filter width and time delay change the appearance of different dynamics (chaotic and mixed mode oscillations). The results are in a good agreement with the experimental observations. The system transits from the case of coherence collapse case in conventional optical feedback to a coherent case with a filtered mode in OFF.

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## Diffraction Lloyd mirror interferometer: A new tool for basic studies on diffraction and interference of light

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Diffraction and interference are two of the basic phenomena which validate wave nature of light. These effects are not limited to light only but are also taking place in all the areas of science and engineering where any type of wave propagation is involved including matter waves, acoustic waves, or other electromagnetic waves. These also form basis of many other areas like holography, microscopy, optical communication, imaging, sensors, quantum optics, etc. Thus it is desirable that a proper understanding about these phenomena should be developed. In this talk, I will discuss about a new type of interferometer developed at CSIR-CSIO, Chandigarh and named as, "Diffraction Lloyd Mirror Interferometer". In this configuration light diffracted from an aperture is divided into two wavefronts which are again superimposed on each other with the help of a Lloyd's mirror. The interferometer generates two-beam interference fringes, analogous to that the well-known Lloyd's mirror interferometer, not only in geometrically illuminated region but also deep inside the geometrically shadow region. Uniqueness of the interferometer lies in the fact that it works on diffracted light and thus is helpful in explaining and demonstrating various key features of diffraction and interference phenomena of the light, which is not possible with any other existing interferometric configurations. Principle of the interferometer will be explained and results of few of the experimental investigations carried on diffraction and interference of light using the interferometer will be discussed.

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