Future Scope

Orange emission from Mn doped ZnSe comes from localized Mn impurities. It would be worth investigating the effect of isoelectronic centers on emission from delocalized ion like Cu$^{2+}$. The emission in delocalized ion arises from transition from conduction band to Cu leading to Cu$^+$ formation. In other words Cu also plays a role of trap center. The dynamics in such structure would be interesting and new physics would come out of such studies. Moreover, by forming consecutively larger NCs and doping them with isoelectronic centers could provide information about the size below which isoelectronic centers can be seen at room temperature. The effect of trapped centers on magnetic properties of such centers could be studied in more details. As these are the trap centers they could induce magnetism in usually diamagnetic material.

Reduction in dark bright gap in graded core shell NCs could be further probed and understood by performing temperature dependent time resolved measurements. Using Temperature dependant time resolved photoluminescence exact value of dark bright gap in these NCs could be obtained. This information can be used to understand the mechanism by which dark bright gap in these NCs reduces with alloying. The effect of concentration of alloy on the electron energy levels could be studied with varying the concentration of Zn in Zn$_{1-x}$Cd$_x$Se NCs. Such a study will provide the concentration dependence of electronic energy levels in alloyed and graded structure. Moreover, the engineering of excited state energy levels in alloyed structure of other systems like CdSe$_{1-x}$S$_x$ can be studied.

At a single NC levels graded core shell structures shows reduced blinking. This reduction in blinking is attributed to absence of defect in the NCs. However, detailed information on Auger assisted blinking could not be attained by the study performed in this thesis. In case of graded and alloyed structure more insight in the Auger rate could be obtained by looking at the time resolved photoluminescence. This information when collected on the single NC level would provide insight in the Auger assisted blinking in these NCs. Similar study on other graded core shell NCs would reaffirm the conclusions derived from single NC study in this thesis.