

RECENT DEVELOPMENT AT CSRF/SRC: TIME RESOLVED X-RAY EXCITED OPTICAL LUMINESCENCE

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X-ray excited optical luminescence is a promising approach to study the structure-electronic-optical property correlation of light emitting materials, especially materials that are potential candidates for optoelectronic and biosensor applications. Being sensitive to the material geometrical constraints on the nano scale, photoluminescence provides a powerful tool to study crystalline, but also amorphous low dimensional systems, as they are characteristic for nano structured materials. A crucial property of luminescence is the variable and relatively slow decay time in many cases, i.e. longer lifetime, which gives a clue to the understanding of the nature of the electronic states involved.

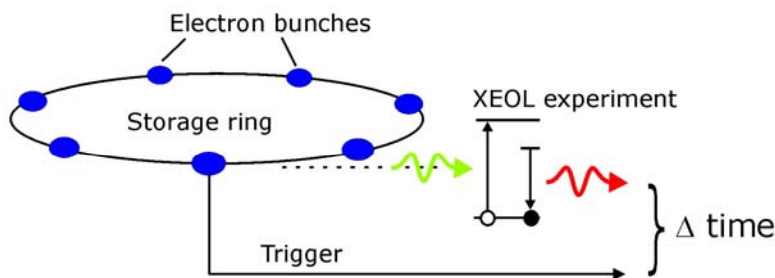


Figure 1: Principle of time gated XEOL

the synchrotron storage ring, which give short x-ray pulses (pico seconds) suitable to excite the samples, and with wide non-radiative gaps between the bunches on the nano to tens of nano second scale, which permit the study of the decay channels. The capabilities and limits of this technique are discussed and illustrating experimental results are presented.

In this work we present an experimental pump-probe technique to study time resolved luminescence by using the time structure of synchrotron radiation. In particular we are taking advantage of the bunched distribution of the electrons in