

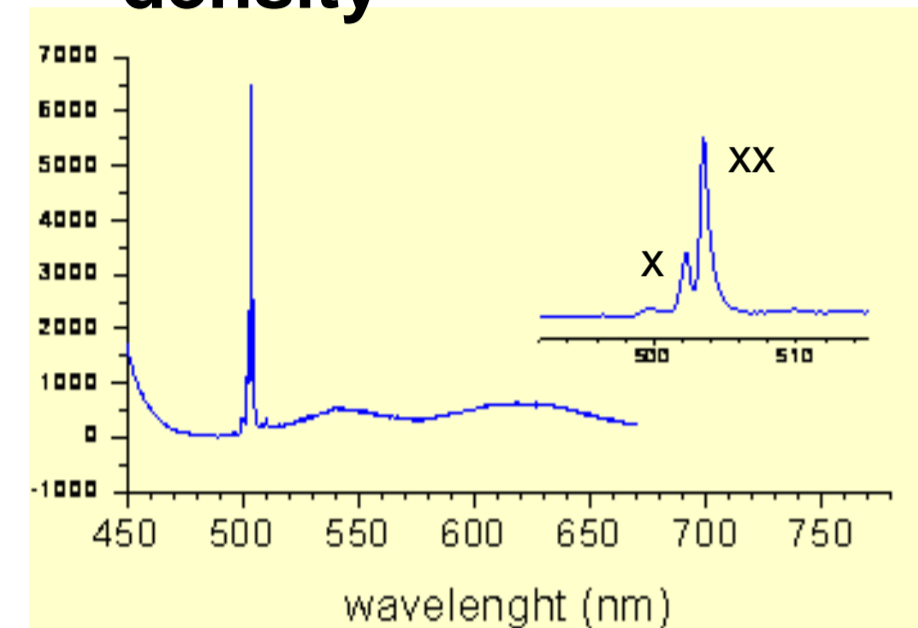
CdSe Quantum Dots Insertion in ZnSe Nanowires: MBE Growth and Microstructural Analysis

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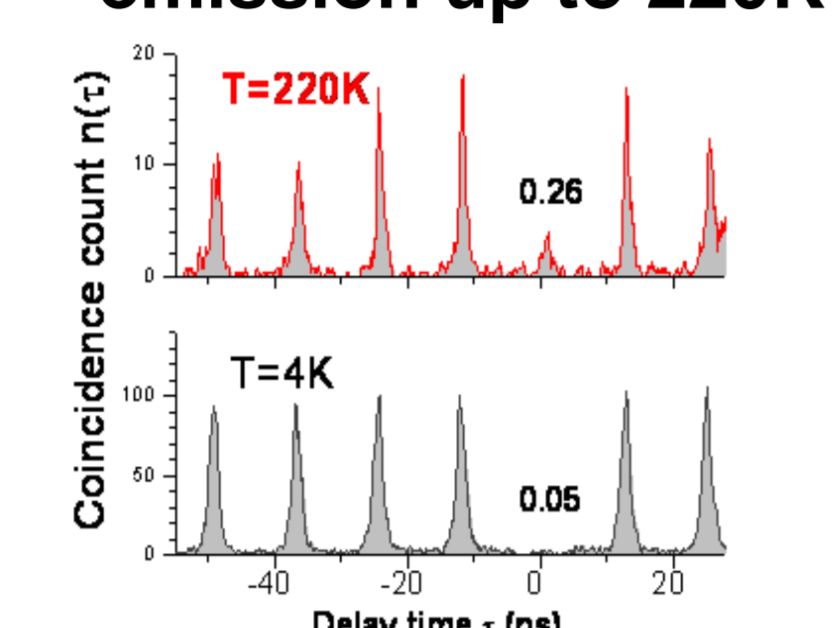
Previous Study

ZnSe NW with CdSe QDs grown on SiO₂ surface demonstrating:

(a) High emission density

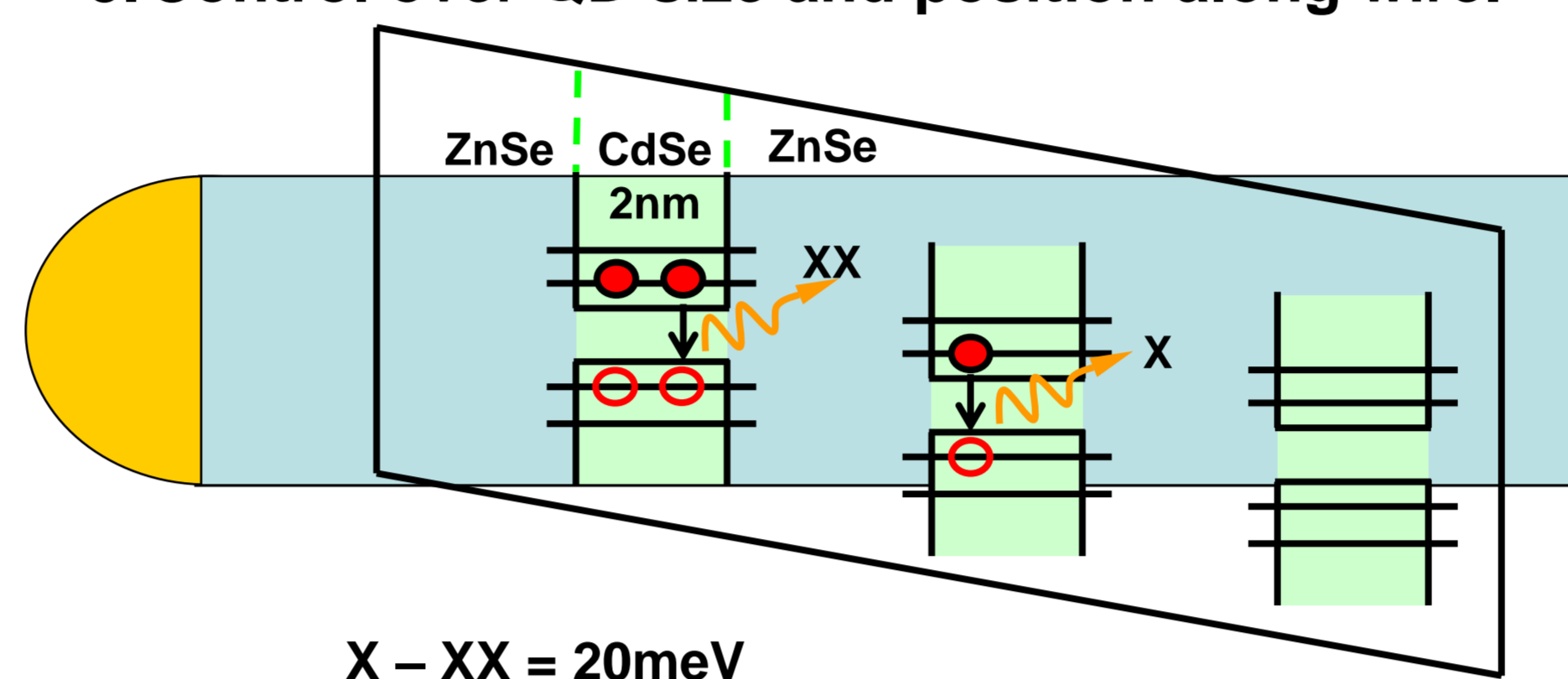


(b) Single photon emission up to 220K



Motivations

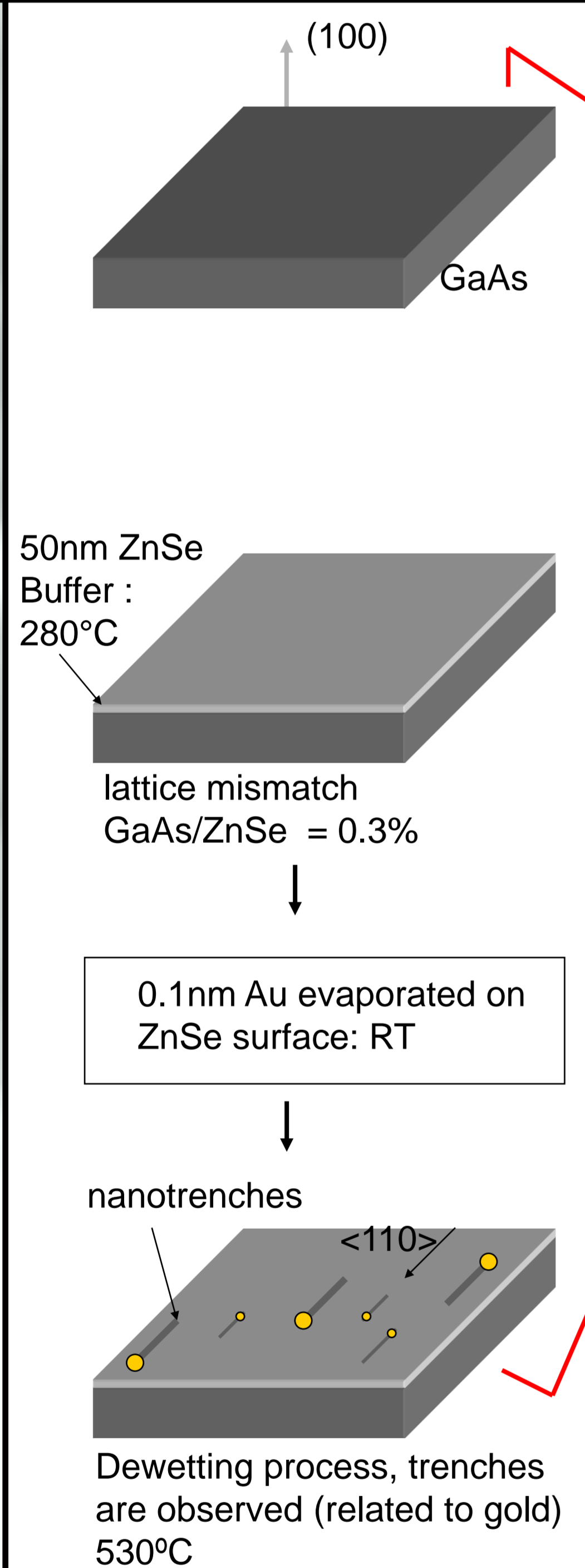
1. Large exciton-exciton binding energy in CdSe
2. Strong carrier confinement in CdSe/ZnSe system
3. Short decay time (300ps)
4. Interesting for high temperature operations
5. Control over QD size and position along wire.



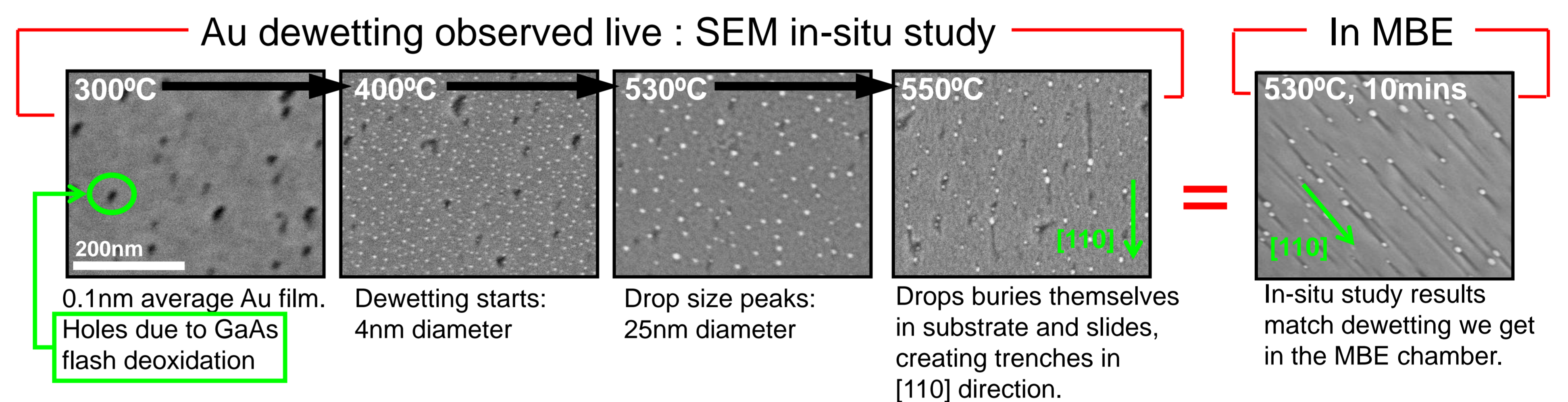
Current Study

1. Investigation of Au drops localization
2. Control NW orientation by seeking an epitaxial relationship between the NW and a ZnSe buffer layer
3. Demonstration of the presence of the CdSe QD in the ZnSe NW.

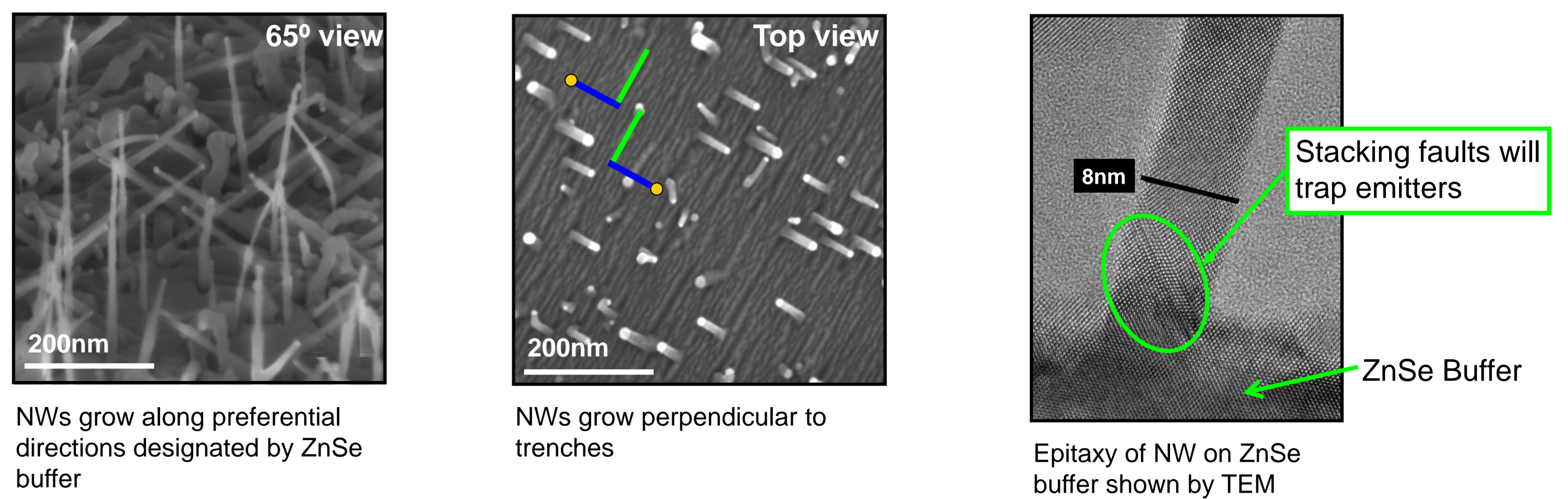
VLS Based Growth Process



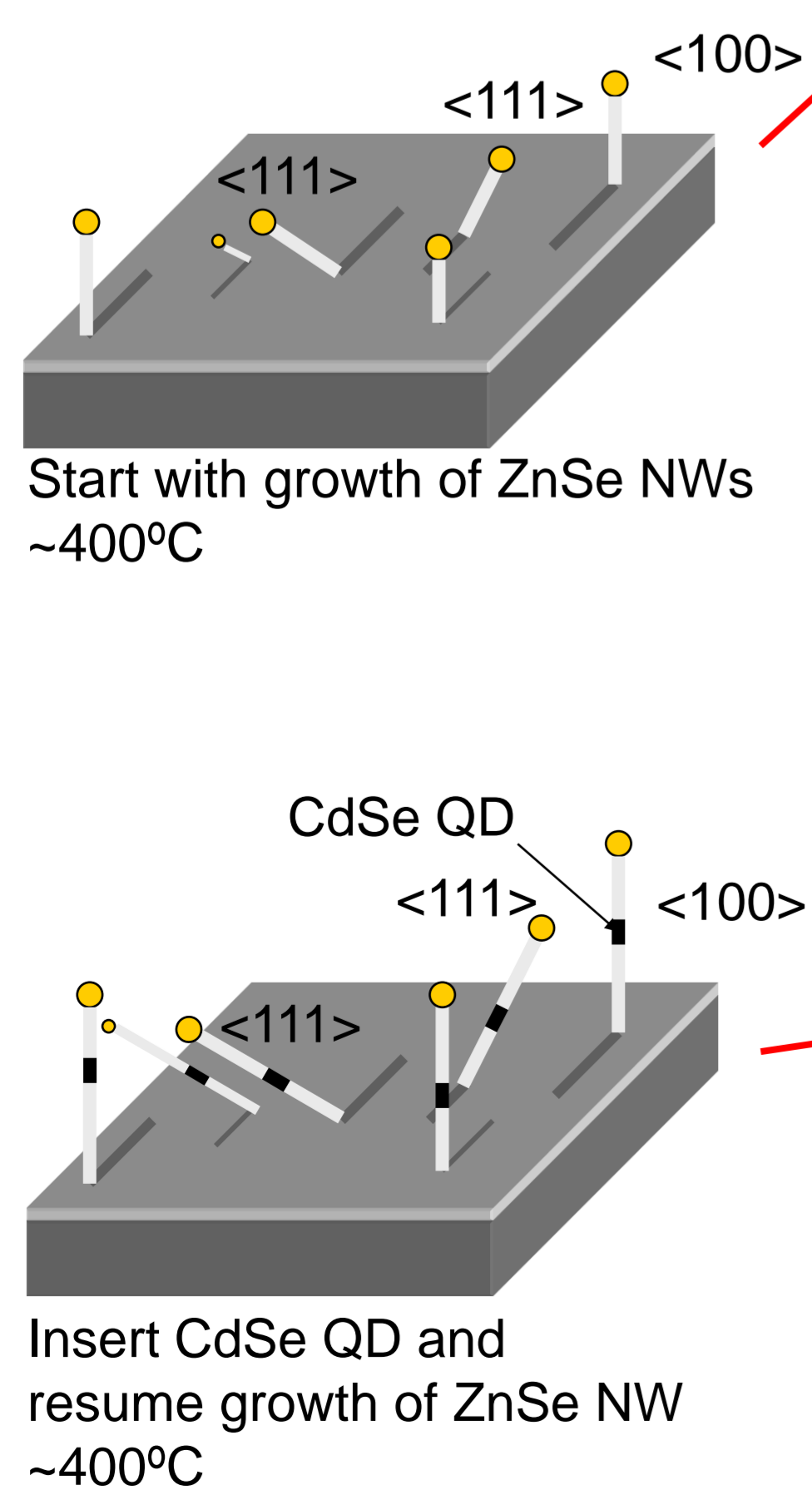
Au Drops Localization in Dewetting



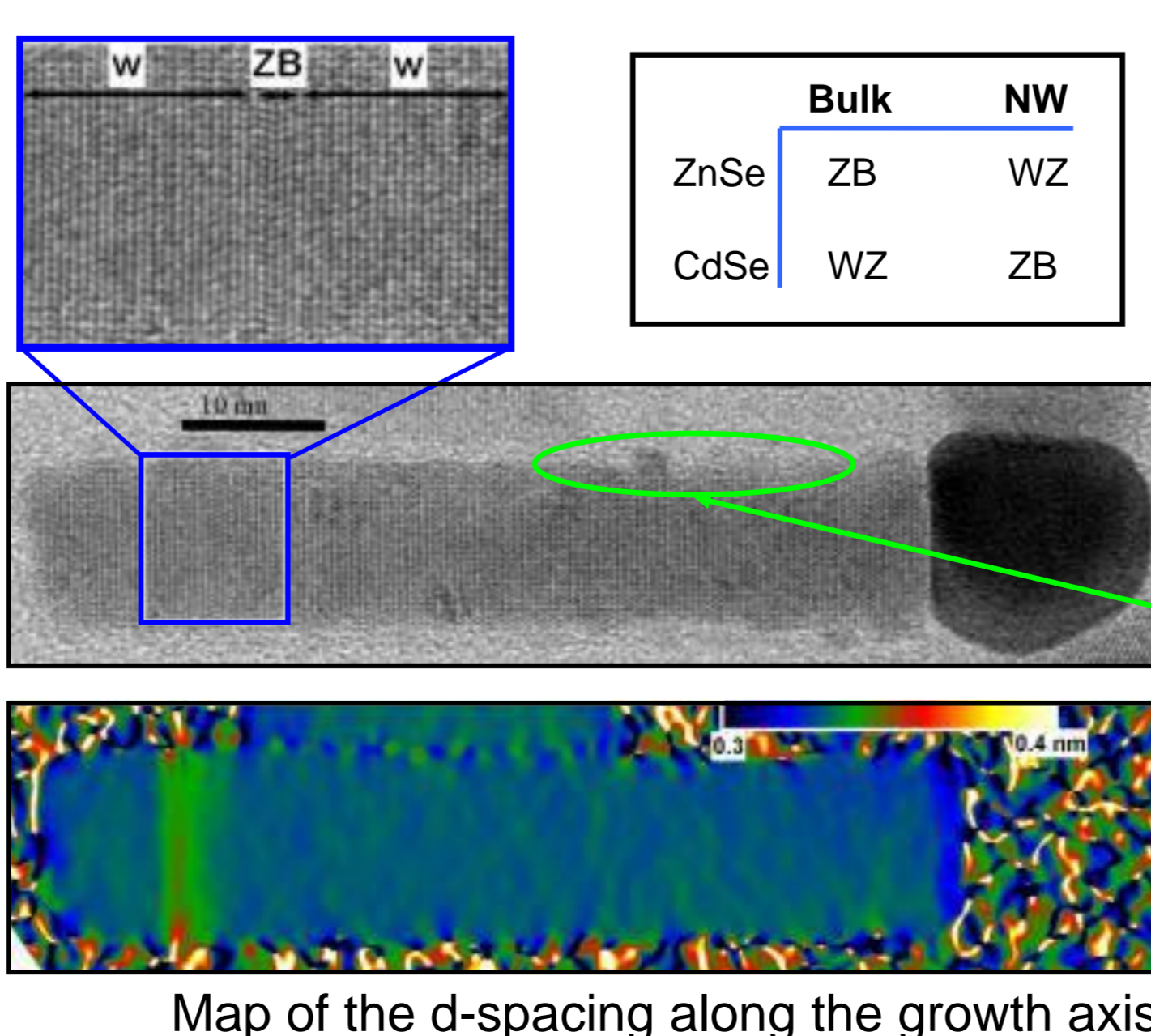
Epitaxial relationship between ZnSe NW and ZnSe buffer



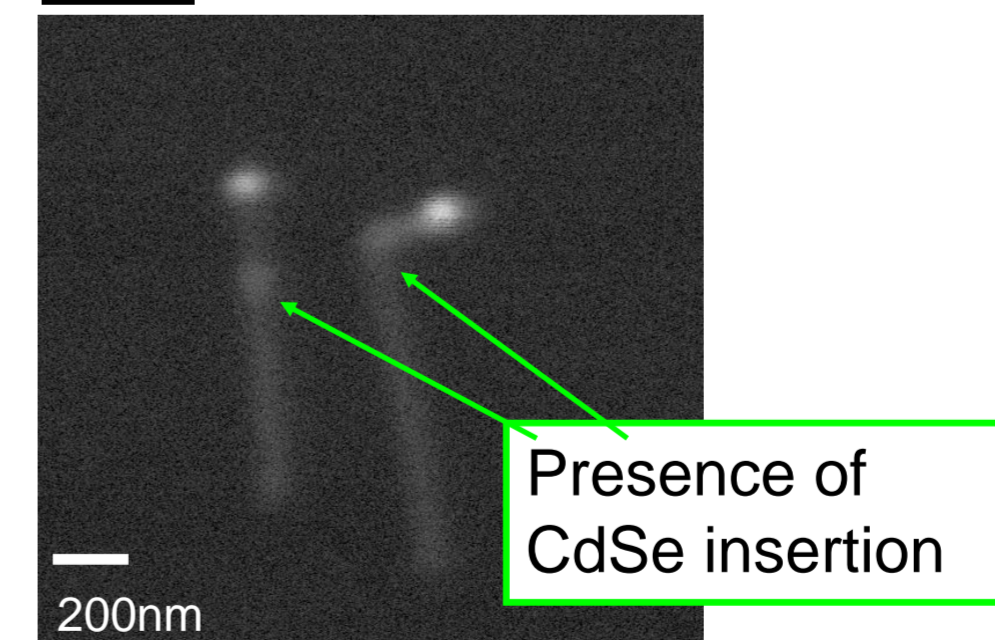
Presence of CdSe QD and Photoluminescence



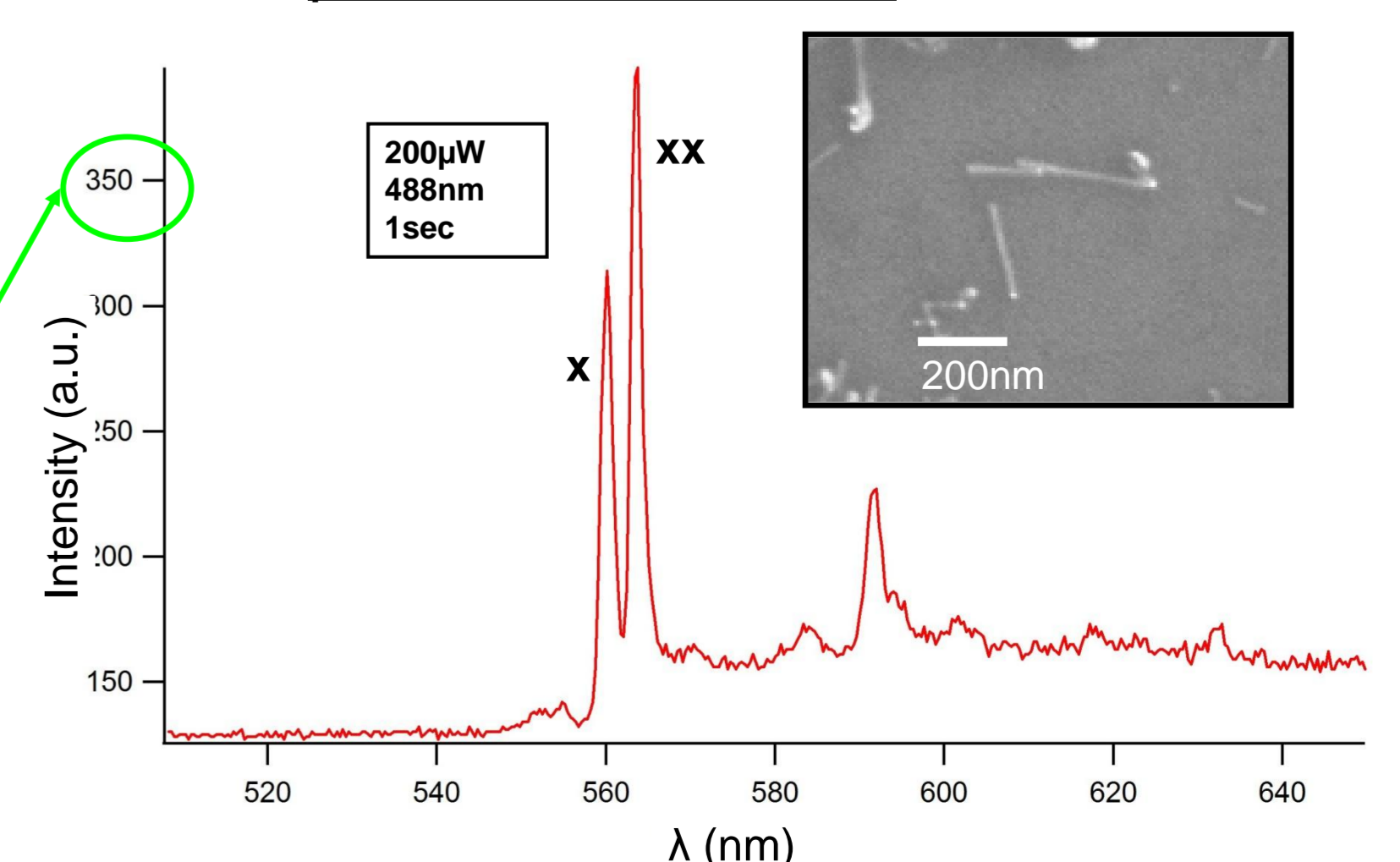
HRTEM



EDX



μPhotoluminescence



Low emission density could be due to Au and/or Zn on NW surface