Proposal Acronym	ZnO band gap study
Proposal Title:	Effective modulation of ZnO band gap and the modulation mechanism study
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Research area:	Physics PHY
Sub-discipline of research area:	PHY-Condensed mater-Semiconductor
Category of research:	applied
[redacted]	[redacted]
Abstract:	With a wide band gap of 3.37eV and a large exciton binding energy of 60meV at room temperature, ZnO has been considered as a promising material for optoelectronic devices.To realize ZnO-based devices, band gap engineering is necessary to controlling or altering the band gap of ZnO, which can be achieved by alloying with MgO, CdO or BeO. In the proposal, we would like to realize the effective doping of Mg, Cd and Be in ZnO films and nanowires by magnetron sputtering and chemical vapour deposition (CVD), optimizing the growth parameters of AxZn1-xO materials and controlling the stress and phase separation of AxZn1-xO materials, which results in the effective modulation of ZnO band gap. Besides, we will study and understand the modulation mechanism of ZnO band gap to establish scientific basis and technical support for the designs of ZnO-based devices.
Does this proposal possess any of the sensitive ethical issues detailed in ethical issues table?:	No