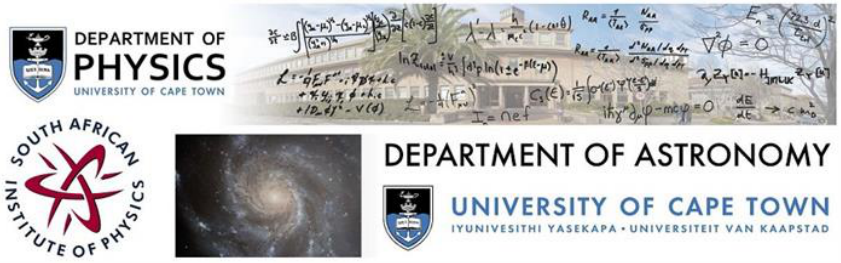

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Structure and luminescence of sol-gel spin coated ZnO films

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Abstract content
   (Max 300 words)
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ZnO thin films were successfully synthesized by the sol-gel method using spin coating. The films were annealed at 600 ℃ in air for 2 h and then in a flowing Ar-H2 reducing atmosphere for different times. The unannealed film was amorphous. A c-axis preferred orientation exhibiting the (002) plane was obtained for the films that were annealed at 600 ℃ in air. The films annealed in the reducing atmosphere contained a secondary phase of ZnOH identified by X-ray diffraction. Scanning electron microscopy images confirmed that the annealed films contain spherically shaped particles. The annealing temperature and environment have an effect on the optical properties of the thin films. The unannealed film exhibited a strong ultraviolet (UV) emission around 387 nm as well as a weak deep level emission in the visible range. Annealing in air increased the deep level emission relative to the UV emission. The films annealed in the reducing atmosphere exhibited primarily a green emission around 511 nm and the UV emission was very weak. The films were also exposed to a prolonged electron bombardment in vacuum and the films annealed in a reducing atmosphere for longer times showed reasonable stability these conditions.

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Main supervisor (name and email)
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