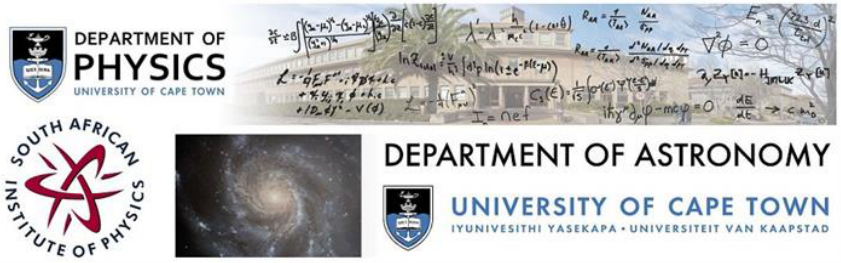

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Development of a large mode area (LMA), high-power, thulium-doped fibre laser

Tuesday, 5 July 2016 10:00 (20 minutes)

Abstract content
   (Max 300 words)
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Thulium-doped fibre lasers are useful 2 micron sources that can be used for light detection and ranging (LIDAR), free space propagation of light, medical surgery and pumping of optical parametric oscillators (OPO). We investigated a high-power, large mode area (LMA), free space coupled, thulium-doped fibre laser which was pumped by 793 nm laser diodes. The fibre laser was characterized with regard to efficiency, beam quality, output power stability, and wavelength. Characterisation was also done with two intra-cavity volume Bragg gratings (VBG's). We achieved more than 60 W of stable, continuous wave output from a 3.7 m long thulium-doped fibre with a near theoretical limit slope efficiency of 54%. This output was achieved at the free running output wavelength of 2014 nm. The beam profile had a measured beam quality factor (M2) of 1.85 at 60 W of average laser power.

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Main supervisor (name and email)
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Dr. Lorinda Wu, LWua@csir.co.za, Council for Scientific and Industrial Research (CSIR)

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