Abstract Submitted
for the FWS17 Meeting of
The American Physical Society

Characterization and exploration of self pulsing behaviour in Holmium-doped fluoride fibers MATTHEW BRIGGS, University of Sydney — Mid-infrared lasers have a multitude of applications, which are typified by medical, military and sensing applications. Fiber lasers provide an advantage due to their high beam quality and high surface to volume ratio, which allows for efficient cooling; they are comparatively speaking low maintenance high power CW lasers in operation. The mid-infrared field has been largely dominated by thulium doped lasers, which have been characterised as high power CW lasers that can be readily operated in Q-switched and mode locked regimes. These lasers have been limited to approximately 2.1 μm however the definition of mid-infrared has sometimes been referred to as being 3 μm or longer wavelengths. By exploring the Holmium-only doped fiber laser, the better understanding of mid-infrared lasers is gained. A system of self-pulsing in the kHz region was observed in a ˜4 metre and ˜3.5 metre Ho^{3+}-doped laser, in addition to round trip MHz self-pulsing operation in both. The operation of the laser in both the spatial, temporal and spectral domains was examined.
The laser was also characterised in terms of power and pump efficiency.

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Date submitted: 03 Oct 2017 Electronic form version 1.4