

EPIC Online Technology Meeting on Quantum Computing 19 May 2020



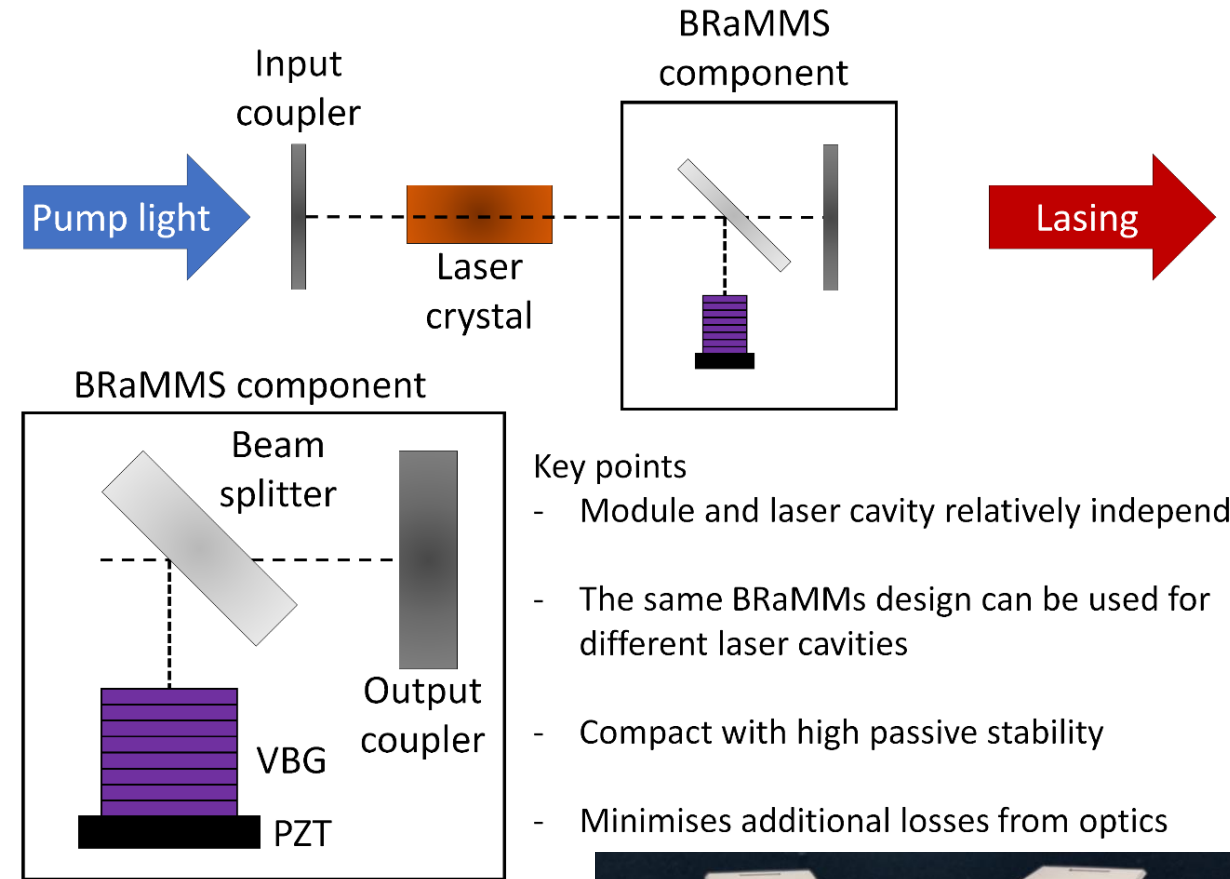
UniKLasers

Produces single frequency lasers at a range of wavelengths from UV to near-IR wavelengths. Applications include Holography, Quantum photonics, Raman and Brillouin scattering.

Single frequency technology - BRaMMS

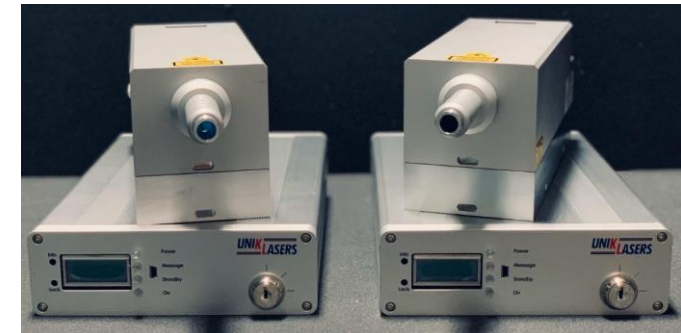
Bragg Range Michelson Mode Selector (BRaMMS) combines a Volume Bragg Grating (VBG) with a Michelson interferometer to ensure single frequency performance.

- Design is compact giving inherent stability over time
- Losses from each component are minimised
- Leakage from the interferometer is used for locking
- Combined with tilt-locking BRaMMS achieves narrow linewidth and good long term wavelength stability.



Key points

- Module and laser cavity relatively independent
- The same BRaMMS design can be used for different laser cavities
- Compact with high passive stability
- Minimises additional losses from optics



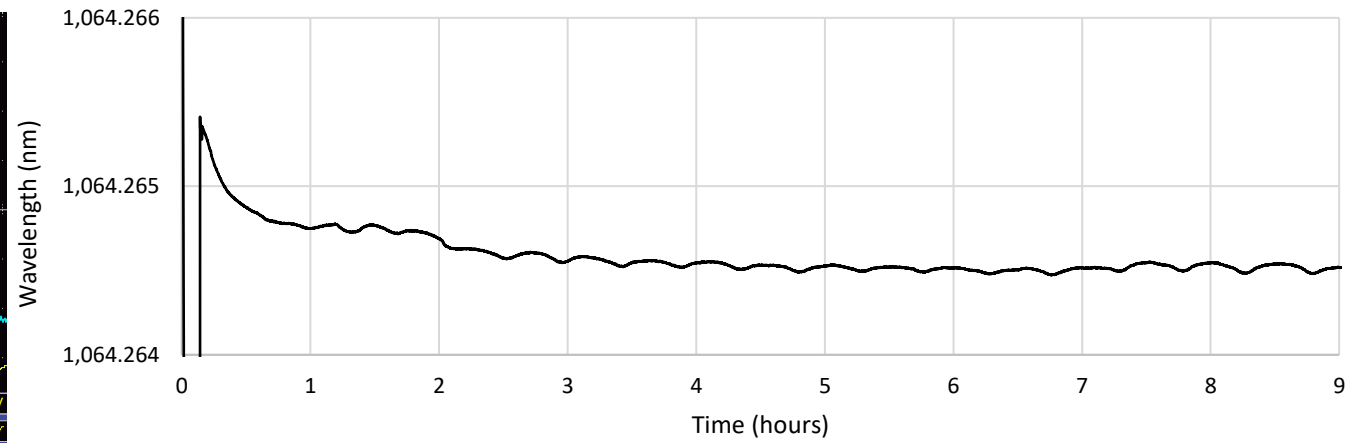
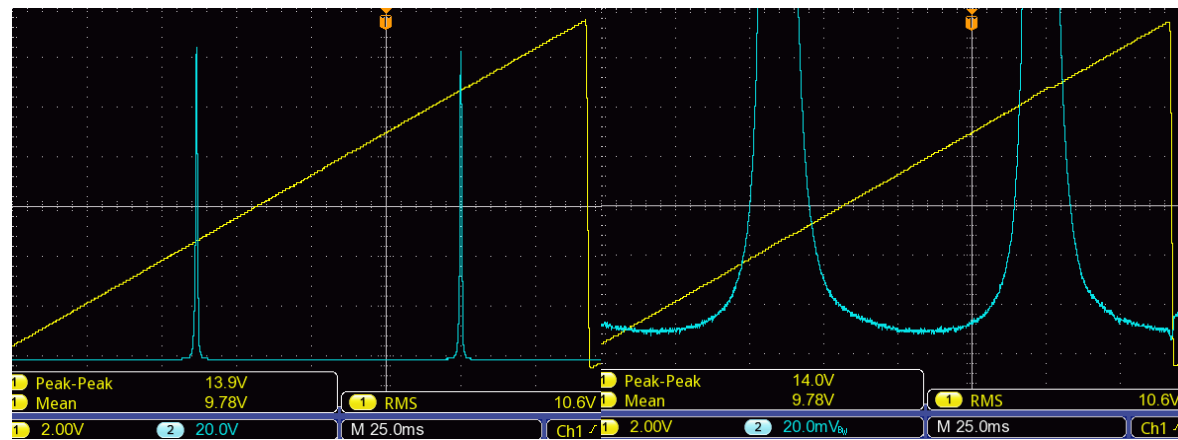
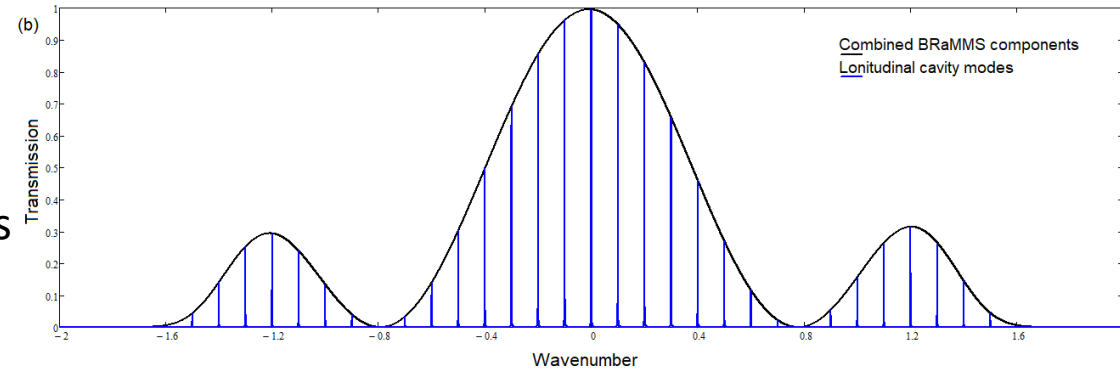
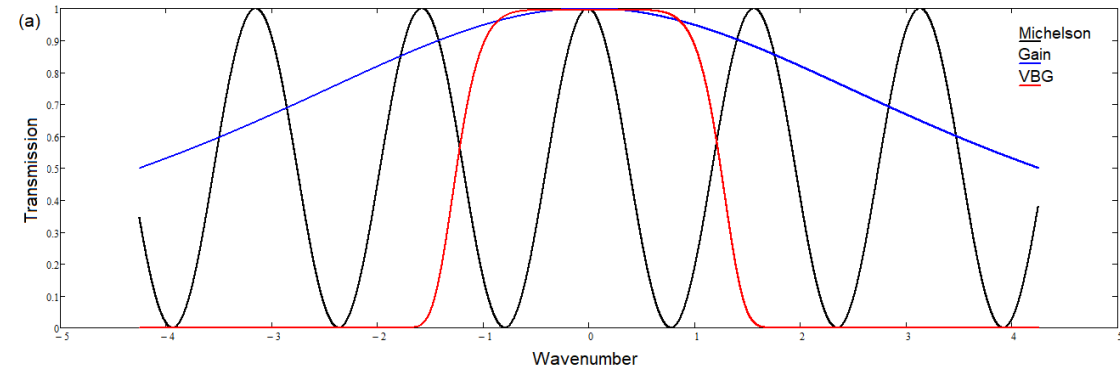


BRaMMS performance

The interferometer arm length can be optimised to give the best single frequency performance when combined with the VBG as shown in the model.

Development of improved systems

We have started development work on new lasers at wavelengths for quantum photonics applications, 689, 698.4, 780.24 and 813nm. These will improve on the performance of our existing systems further in terms of linewidth and frequency stability.



EPIC Online Technology Meeting on Quantum Computing 19 May 2020



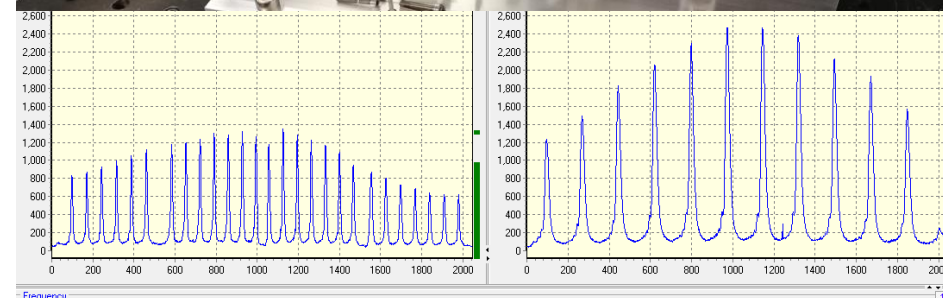
Development projects

We are involved in number of UKRI funded projects to develop new systems. The largest of these is Gravity PIONEER working on a 780.24nm laser.

- Improved locking with drift of 60 fm over 12 hours, ongoing work to reduce this further
- Optimised design to reduce thermal effects on laser and reduce noise for improved linewidth
- Project will include environmental testing conducted with partners

What we are looking for

We are interested in partnering with companies and universities working in the quantum photonics sector who can help us trial and improve our lasers for specific applications, highlighting any current deficiencies or areas for improvement. Contact us if you think you may be interested.



384.09480 THz

