

Re: Current Controller for Laser Diode

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In article <421c566f\$0\$3408\$5402220f@news.sunrise.ch>, Rene Tschaggelar <none@none.net> wrote:

[...]

>*The hardware is fairly cheap.*

Define "fairly cheap". Looking at what you've listed below, it looks to me like the laser system will cost over \$1000US. I was hoping you had come up with something that the group in the land down under had missed. It looks like you've suggest the same basic kit as them. I guess that is reasonable as it is most likely the best way to do it if you don't have the new vertical cavity technology. The one thing they stressed was the need for very good mechanical stability in all of the parts.

> *You need the laser diode of*

> *yours, but on the backside, where usually the monitor is,*

> *you need an antireflex coat. A lambda quarter of falcium*

> *floride or such. Then you need some optics to expand the beam,*

> *An achromat or a microscope lens. Having the beam widened up,*

> *it goes as moreless parallel beam to a grating. 30\$ or so*

> *at Edmund Scientific. The grating retroreflects the wanted*

> *wavelengths back. The selection of the wavelength is the angle*

> *of the grating. This job is mainly mechanical, setting up*

> *the lot on a sturdy plate, adjusting the angles, remove*

> *hysteresis ...*

> *Note that laser gain equation have now the lenses and the*

> *grating in it as losses. This means the lens system should*

> *accomodate for the large NA.*

> *A longer laser cavity has less longitudinal modes and the*

> *grating is selective amongst them.*

>

>>

>> *NIST is trying for a atomic clock that competes with the OCXOs. They've*

>> *got quite a ways to go yet on the development.*

>

> *I read some articles about that. Considering that I get an OCXO*

> *in less than half a cubic inch, running between 0 and 50degC, at*

> *less than a watt, for 500\$, that is quite a task.*

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They seem to be inching towards actually doing it. The laser production yield is still a bit of an issue. The vertical cavity laser has to run at the 894 line. Only a small cross sectioned ring of them on the wafer end up wanting to run there. The rest are either too high or too low. This is a silicon growing issue that they have to get a handle on.

Running the light through the body of the cell twice by using a mirror on the far side solves one of the big mechanical issues by forcing the light to average to parallel. Switching to CPT turns the 9GHz from RF cavity to modulator issues.

One of the folks who is working on this told me that he can see a production price of something like \$100 in the future. There is nothing in the system that is by its nature expensive other than perhaps the laser its self.

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kensmith@rahul.net forging knowledge