21 digits.

Difference Frequency Comb

World record stability...
... has never been easier!

Patented CERO ("zero-f_{CEO}") technology

Download scientific paper!

TOPTICA

www.toptica.com/dfc

DFC CORE +

Compact high-performance frequency comb

DANGER – VISIBLE AND INVISIBLE LASER RADIATION, AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION, CLASS 4 LASER PRODUCT, EN60825-1:2014

Specifications	DFC CORE +	
Center wavelength	1560 nm (420 nm .. 2000 nm available via extensions, see website)	
Comb spacing	200 MHz or 80 MHz	
Laser outputs	4 or 8, fiber coupled, polarization maintaining, FC/APC	
Bandwidth	> 20 nm, each output	
Power	> 10 mW, each output	
Offset frequency f_{CEO}	f_{CEO} = 0, by passive stabilization via difference frequency generation	
Integrated phase noise f_{CEO}	< 40 mrad [100 Hz..2 MHz], < 65 mrad [70 mHz..20 MHz]	
Linewidth @ 1560 nm	< 1 Hz *	
Loop bandwidth f_{rep} lock	> 400 kHz (typ. 450 kHz)*	10 kHz, optimal with DFC RF
Stability	$8 \cdot 10^{-18}$ in 1s *, $5 \cdot 10^{-20}$ in 1000 s*	$1 \cdot 10^{-13}$ in 1 s**
Accuracy	$1 \cdot 10^{-18}$ for τ > 100 s*	$1 \cdot 10^{-14}$ for τ > 100 s**
Bandwidth piezo f_{rep}	> 50 kHz	
Reference	Optical reference*** or RF reference ***	
Reference input	· 800 MHz for RF reference · 10 MHz with DFC RF · High bandwidth I_{mod} (DC..10 MHz) for optical reference	
Dimensions (H x W x D)	133 x 450 x 633 mm^3, incl. electronics	
Cooling requirements	Air cooled	
Power consumption	< 110 W	
Operating temperature	21 ± 4 °C	
Weight	< 32 kg	
Power supply	100...120 V / 220..240 VAC, 50.S.60 Hz (auto detect)	
Control computer	Laptop, Windows operating system, English	

* Phase-locked to optical reference, ** Phase-locked to RF reference, *** optional