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BENCHTOP POLARIZATION-ENTANGLED PHOTON SOURCES: RUBY & EMERALD

PRELIMINARY

Features:

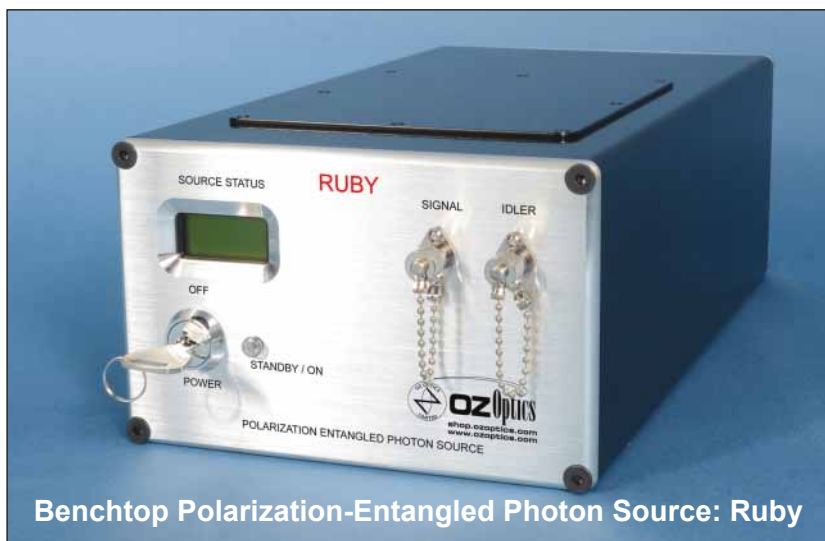
- High-quality turn-key polarization entanglement
- Custom wavelength offerings
- Rugged, room temperature operation

Applications:

- Quantum Information Science
- Quantum metrology
- Quantum key distribution
- Quantum computing and information processing

Product Description:

Ruby and Emerald are crystal based polarization entangled photon sources which integrate the interferometer engines Guaraldi and Gershwin* into a robust benchtop turn-key device. Each source comes equipped with a wavelength stabilized pump laser, a variable optical attenuator, and a temperature controller to control the source phase matching parameters. The components are packaged inside a rugged aluminum housing with on/off power switch and keyed laser control. Signal and Idler photons are available with pump wavelength removed at separate output ports on the front panel.



Benchtop Polarization-Entangled Photon Source: Ruby



Benchtop Polarization-Entangled Photon Source: Emerald

* Please see our data sheet *Polarization Entangled Photon Sources: Gershwin & Guaraldi - OEM*
https://www.ozoptics.com/ALLNEW_PDF/DTS0178.pdf

Performance Specifications¹

Part number: EPG-1000-3A3A-W _s W _i -a _s /b _s ,a _i /b _i				
Parameter	Max.	Typical	Min.	Unit
Signal/Idler degeneracy wavelength	1560	Custom	810	nm
Signal/Idler degeneracy wavelength accuracy	-	±2	-	nm
Biphoton bandwidth (3 dB)	Phase matching dependent			nm
Pair-generation rate	4x10 ⁶	Custom	1x10 ⁵	Pairs/second
Coincidence-to-accidental ratio ²	-	1000	100	
Fidelity ⁵ to $ \Psi\rangle=(HV\rangle+ VH\rangle)/\sqrt{2}$	99%	98%	95%	
Two-photon interference visibility ³	99%	98%	95%	
Physical dimensions	Width x depth x height (cm)	35 x 16.5 x 12.5		
	Weight (kg)	~6		
Power requirements	Ruby	5 V, 8 A		
	Emerald	12 V, 6 A		

Note:
¹ Under continuous-wave (CW) operation.
² Coincidence counts are measured on signal/idler FWHM bandwidth of 16 nm each, over 0.65 ns window, with free-run SPAD detectors having dark counts of ~5 kHz.
³ Measured for both HV basis and AD basis. Without subtracting accidentals.

Optical Specifications:

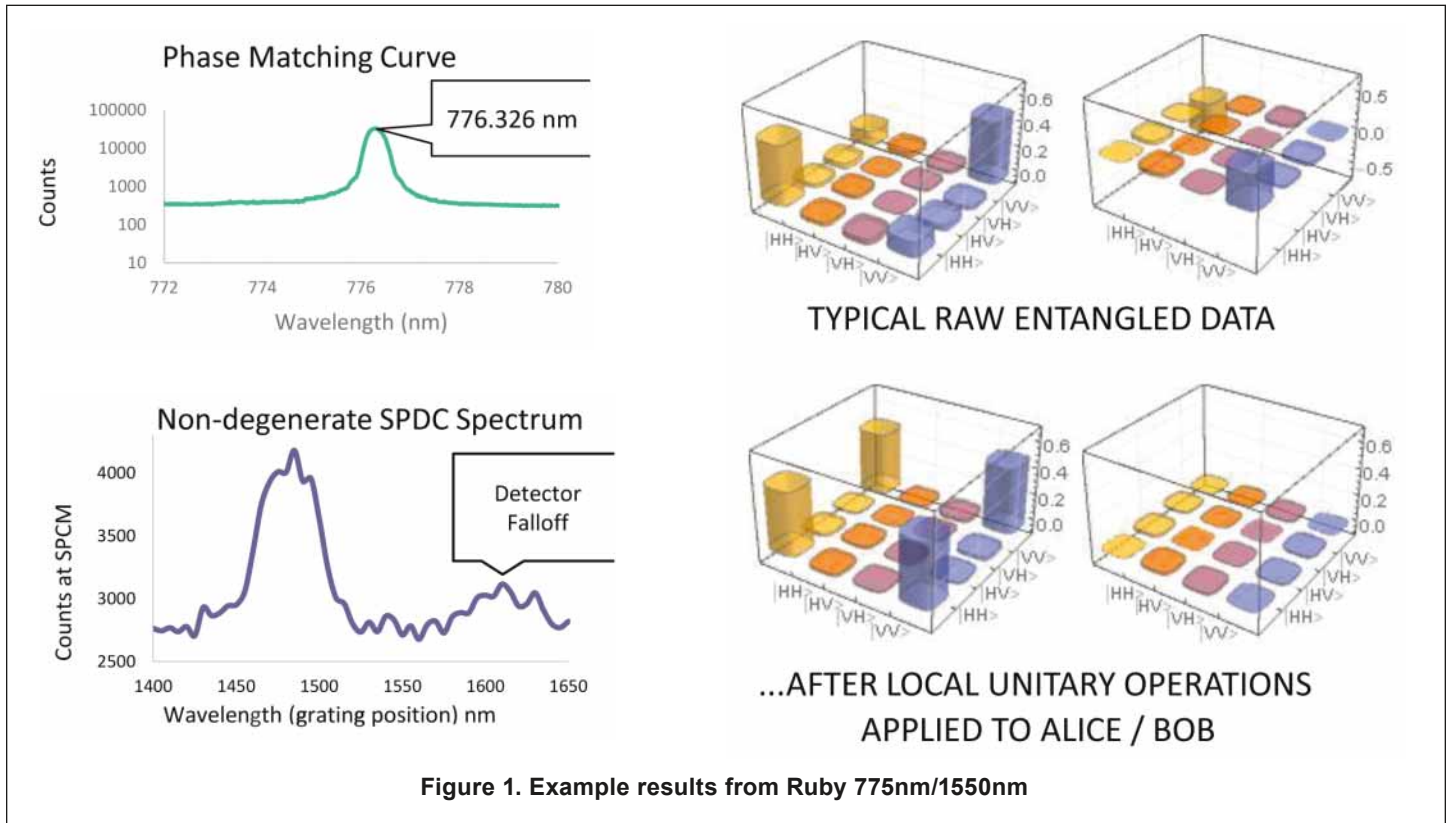


Figure 1. Example results from Ruby 775nm/1550nm

Operating And Storage Conditions:

Parameter	Min.	Max.
Operating temperature	15°C	25°C
Operating relative humidity (% RH)	5	60
Storage temperature	-40°C	40°C
Storage relative humidity (% RH)	0	90

Link To White Paper:

1. Auto-balancing and robust interferometer designs for polarization entangled photon sources, *Optics Express*, Vol.27, Issue 12, pp.17369-17376; <https://doi.org/10.1364/OE.27.017369>

Description: Benchtop Polarization-Entangled Photon Sources: Ruby & Emerald

Part Number: **EPG-1000-XY-W_S,W_I-a_S/b_S,a_I/b_I**

X,Y = Output Connector Codes
3S = Super NTT-FC/PC
3U = Ultra NTT-FC/PC
3A = Angled NTT- FC/PC
SC = SC
SCA = Angled SC
8 = AT&T-ST
MU = MU type connector
LC = LC type connector

a_S/b_S,a_I/b_I = Core/Cladding of signal, idler

W_S,W_I = Wavelength of signal, idler