

FS-SANOS-1064-1

Preliminary data sheet of free-space SANOS @ $\lambda = 1064$ nm with one RSAM

SANOS – Saturable noise suppressor

SANOS applications

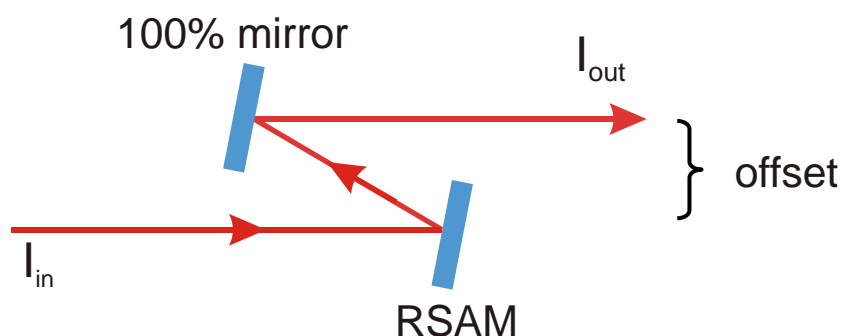
- Suppression of noise (ASE – amplified spontaneous emission) after an optical amplifier
- Suppression of remaining pulses after a pulse picker

Main FS-SANOS data

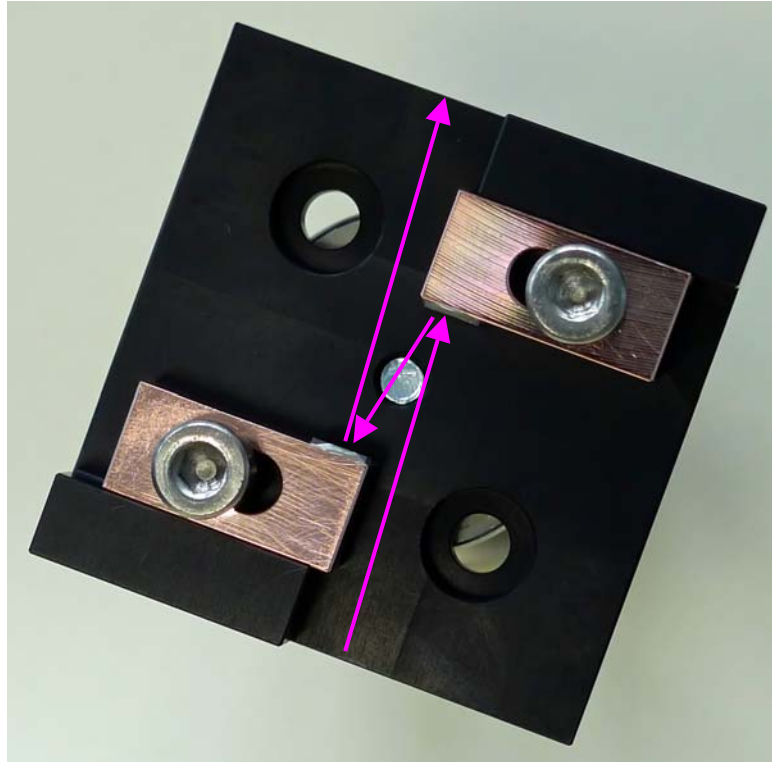
Resonance wavelength	$\lambda = 1064$ nm
Full width at half maximum	FWHM = 17 nm
Noise suppression ratio	14 dB
Insertion loss	3 dB
Saturation fluence	$\Phi_{\text{sat}} = 4 \mu\text{J}/\text{cm}^2$ @ noise suppression of 10 dB
Relaxation time constant	$\tau \sim 5$ ps
Parallel beam offset	2 mm
Mirrors	one RSAM and one dielectric mirror with $R > 99\%$, size: 4 mm x 4 mm
Angle of incidence on mirrors	8°

FS-SANOS description

A FS-SANOS consists of a resonant saturable absorber mirror (RSAM) and a conventional 100% mirror. The beam goes true the FS-SANOS without changing of the direction, but with a parallel offset of 2 mm. The RSAM has a strong non-linear reflectance. For a low input signal level the transmittance of the FS-SANOS is only 2 % (98 % loss), whereas high intensity pulses are transmitted with a lower loss of 50 %. The input is isolated better than 50 dB. To meet exactly the low-intensity reflectance minimum the input beam inclination can be changed by some degrees.

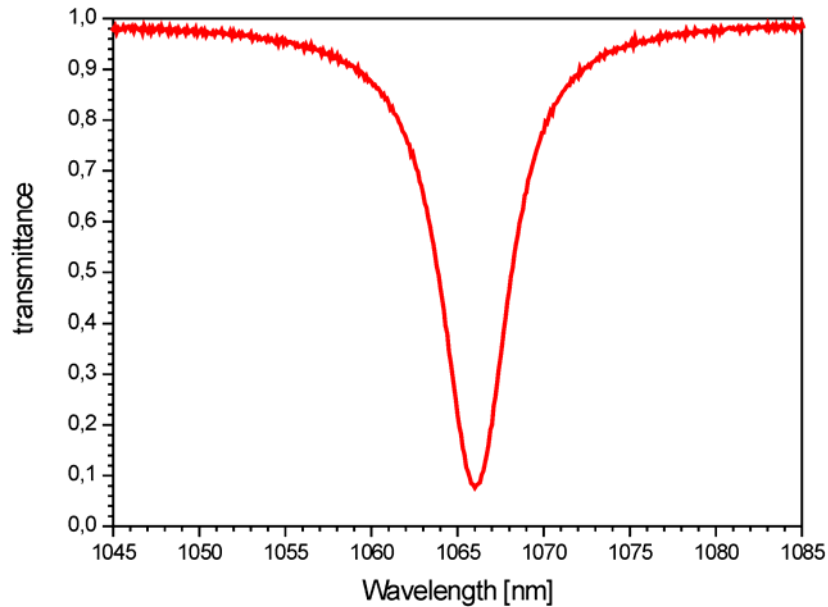


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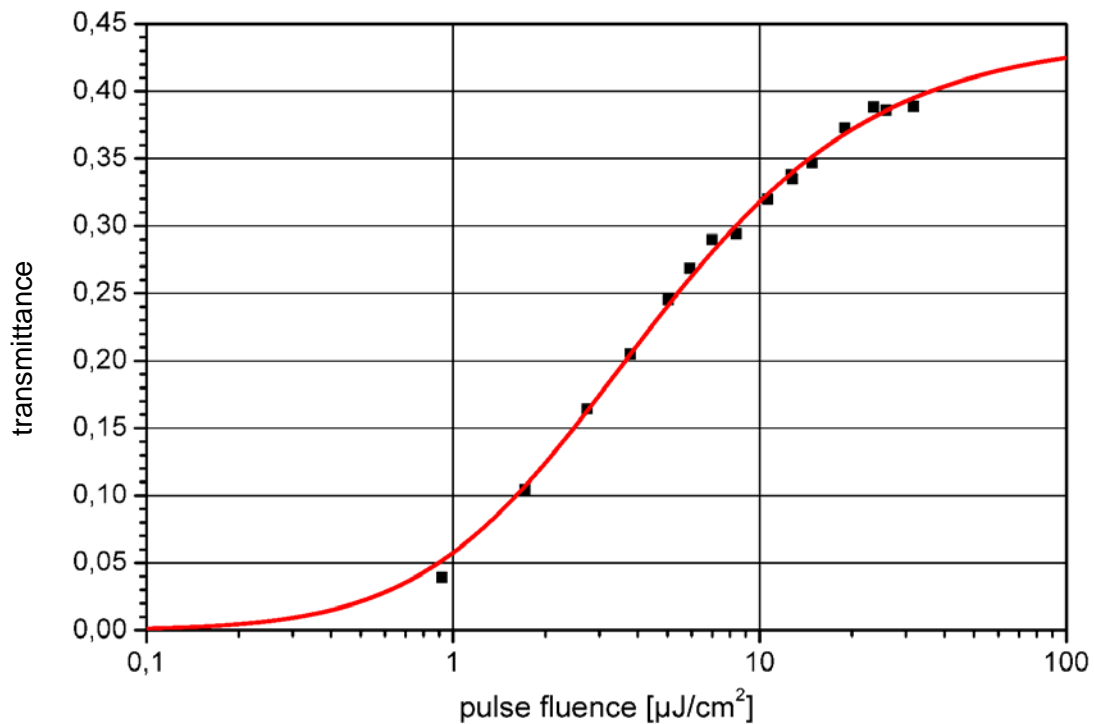
Spectral transmittance I_{out}/I_{in}

Low intensity, unsaturated transmittance, 0° incidence angle



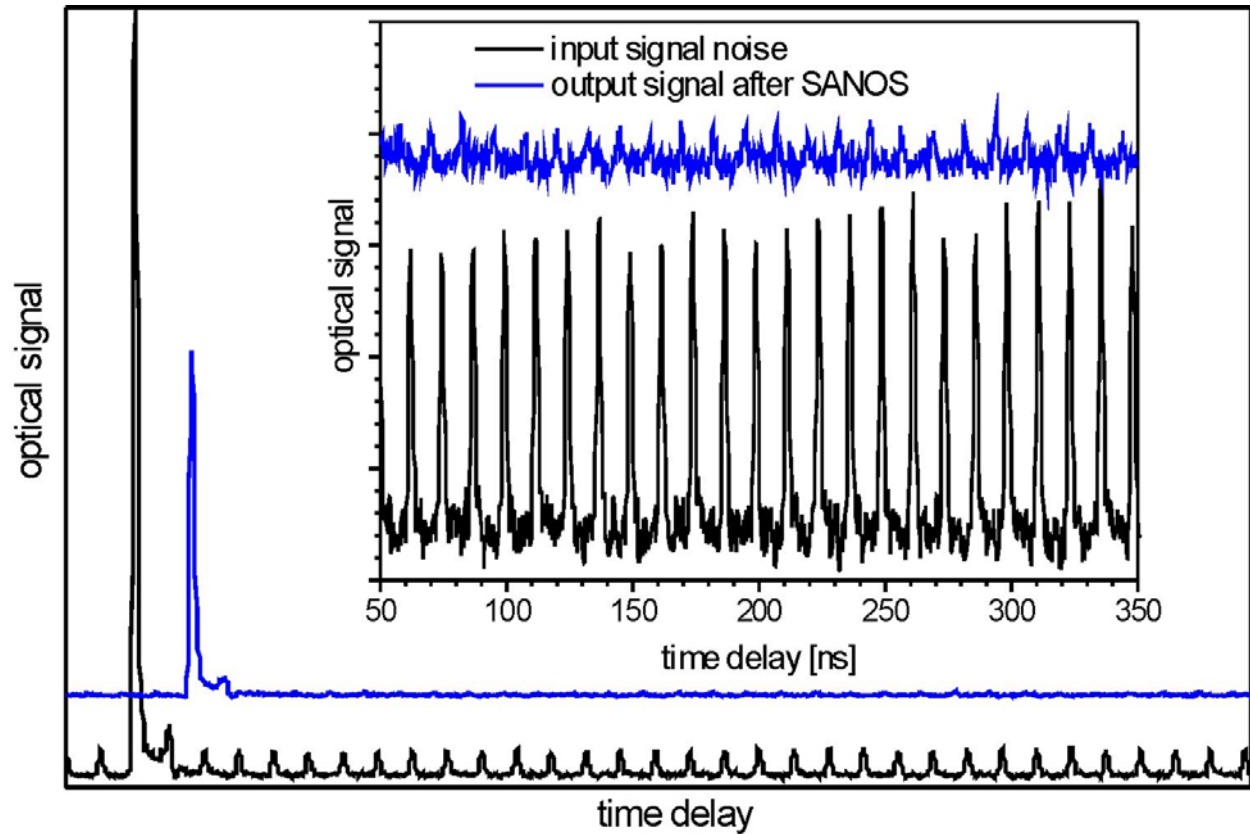
Saturation curve

Dependency of the transmittance on the input pulse fluence (pulse duration 8 ps)



Noise suppression measurement

Measured suppression of small pulses (after a pulse picker) using a SANOS. The black curve is the time dependent optical signal, which hits the SANOS and the blue curve is the SANOS output signal.



The large signal peak is decreased after the SANOS by a factor of about two, whereas the small noise pulses are decreased by about one order of magnitude.