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C-Star Calibration

Date November 11, 2022 S/N# **CST-2405** Pathlength 25 cm

	Analog output	Digital output	
V_{dark}	**0.016 V**	**0 counts**	
V_{air}	**4.792 V**	**15661 counts**	
V_{ref}	**4.699 V**	**15356 counts**	
Temperature of calibration water			**19.6** °C
Ambient temperature during calibration			**21.5** °C

Relationship of transmittance (Tr) to beam attenuation coefficient (c), and pathlength (x, in meters): $\mathbf{Tr = e^{-cx}}$

To determine beam transmittance: $\mathbf{Tr = (V_{sig} - V_{dark}) / (V_{ref} - V_{dark})}$

To determine beam attenuation coefficient: $\mathbf{c = -1/x * ln\ (Tr)}$

$\mathbf{V_{dark}}$ Meter output with the beam blocked. This is the offset.
$\mathbf{V_{air}}$ Meter output in air with a clear beam path.
$\mathbf{V_{ref}}$ Meter output with clean water in the path.
Temperature of calibration water: temperature of clean water used to obtain V_{ref}.
Ambient temperature: meter temperature in air during the calibration.
$\mathbf{V_{sig}}$ Measured signal output of meter.