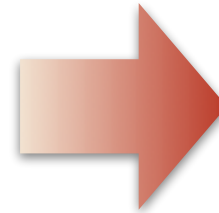


# CYGNO parameters

## From CYGNUS feasibility paper (in preparation)

## He:CF<sub>4</sub> ??

Gas mixture	SF <sub>6</sub>	SF <sub>6</sub> : <sup>4</sup> He
Gas pressure [torr]	20	20:740
W [eV / ion pair]	35.45	?
Transverse diffusion, $\sigma_T$ [ $\mu\text{m} / \sqrt{\text{cm}}$ ]	116.2	116.2
Longitudinal diffusion, $\sigma_z$ [ $\mu\text{m} / \sqrt{\text{cm}}$ ]	116.2	116.2
Drift velocity [ $\mu\text{m}/\mu\text{s}$ ]	140	140
z binning (assume 1MHz sampling) [ $\mu\text{m}/$ ]	140	140
Avalanche gain	9000	9000

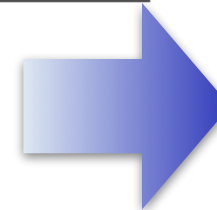


**450:300**  
**40 eV**  
**xx**  
**xx**  
**61000 num/mus**  
**61/100 num**  
**80000 ph/primary e**  
**8 ph/e-**

## Factor 1000 is assumed for photon loss due to $1/r^2$

## PMT + CMOS?

Readout type	Dimensionality	Segmentation (x × y)	Capacitance [pF]	$\sigma_{\text{noise}}$ in 1 $\mu\text{s}$ [e <sup>-</sup> ]	Threshold/ $\sigma_{\text{noise}}$
planar	1D (z)	10 cm × 10 cm	3000	18000	3.09
wire	2D (yz)	1 m wires, 2 mm pitch		800	4.11
pad	1D (z)	3 mm × 3 mm	0.25 (FIXME)	375	4.77
optical	2D (xy)	200 $\mu\text{m}$ × 200 $\mu\text{m}$	n/a	20 photons	5.77
strip	3D (xyz)	1 m strips, 200 $\mu\text{m}$ pitch	500	2800	4.61
pixel	3D (xyz)	200 $\mu\text{m}$ × 200 $\mu\text{m}$	0.012 - 0.200	42	5.77



**Optic**    **3D**    **165 x 165 um2**    **n/a**    **1.3**    **6**