

each feature wants 2-3 pixels

4000 x 3000 pixels

12 MP: 5.3 pix x 4 pix for a .1mm snowflake  
15.8 pix x 11.8 pix for a .3mm snowflake

$R_i = 4000 \times 3000$  pixels

FOV: 76.2 mm = 3 inches  $R_f = 0.1$  mm

$$R_s = \frac{R_f}{F_p} = R_i = \frac{FOV}{R_s}$$

$$4000_p = \frac{76.2 \text{ mm}}{R_s} \quad R_s = 0.019 \frac{\text{mm}}{\text{pix}}$$
$$0.019 = 0.1 \text{ mm} / F_p \quad F_p = 5.26 \text{ pixels}$$

$$3000_p = \frac{76.2 \text{ mm}}{R_s} \quad R_s = 0.0254 \frac{\text{mm}}{\text{pix}}$$
$$0.0254 = 0.1 \text{ mm} / F_p \quad F_p = 3.94 \text{ pixels}$$

Frame Rate:

Speed = 1 m/s or 1000 mm/s

Each frame = 76.2 mm

1. Determine distance snowflake travels in 1 frame within FOV
2. Calculate time for snowflake to travel that distance
3. Take reciprocal

Distance traveled: Diagonal -  $\sqrt{76.2 \text{ mm}^2 + 76.2 \text{ mm}^2} = 108 \text{ mm}$

$$V = d/t$$



22 fps       $41120 \times 3008$  resolution = 12,368,896 pixels  
1 pixel = 12 bits

12,368,896 pixels  $\cdot$  12 bits = 148.42 Mb  $\approx$  18.56 MB

18.56 MB per frame or image

1 camera = 408 MB per second

8 cameras = 3265 MB per second w/ all cameras  
= 3.2 GB