$$AF(\hat{r}) = \sum_{n=1}^{N} a_n e^{jk\hat{r}\cdot\vec{r}_n} = \frac{\sin(N\psi/2)}{N\sin(\psi/2)}, \quad \psi = kd\cos(\theta) = \frac{2\pi}{\lambda}0.7\lambda\cos(\theta), \quad \psi_0 = 1.4\cdot\cos(\theta_0) \tag{1}$$

$$D - D_{new} = 3[db] \rightarrow \frac{D}{D_{new}} = 2 \tag{2}$$

$$2\cdot D_{new} = D \tag{3}$$

$$2\frac{4\pi}{P_{rad,new}} = \frac{4\pi}{P_{rad}} \tag{4}$$

$$P_{rad,new} = 2\cdot P_{rad} \tag{5}$$

$$\int_0^\pi \sin(\theta)AF^2(\theta,\varphi)_{new}\,d\theta = 2\int_0^\pi \sin(\theta)AF^2(\theta,\varphi)\,d\theta \tag{6}$$

$$\int_0^\pi \sin(\theta)\frac{\sin^2(N\psi_{new}/2)}{N^2\sin^2(\psi_{new}/2)}\,d\theta = 2\int_0^\pi \sin(\theta)\frac{\sin^2(N\psi/2)}{N^2\sin^2(\psi/2)}\,d\theta \tag{7}$$

$$\frac{1}{5^2}\int_0^\pi \sin(\theta)\frac{\sin^2(5\cdot1.4\pi(\cos(\theta)+\cos(\theta_0))/2)}{\sin^2(1.4\pi(\cos(\theta)+\cos(\theta_0))/2)}\,d\theta = \frac{2}{5^2}\int_0^\pi \sin(\theta)\frac{\sin^2(5\cdot1.4\pi\cos(\theta)/2)}{\sin^2(1.4\pi\cos(\theta)/2)}\,d\theta \tag{8}$$

$$\int_0^\pi \sin(\theta)\frac{\sin^2(3.5\pi(\cos(\theta)+\cos(\theta_0)))}{\sin^2(0.7\pi(\cos(\theta)+\cos(\theta_0)))}\,d\theta = 2\int_0^\pi \sin(\theta)\frac{\sin^2(3.5\pi\cos(\theta))}{\sin^2(0.7\pi\cos(\theta))}\,d\theta \tag{9}$$

$$\frac{d}{d\theta}\int_0^\pi \sin(\theta)\frac{\sin^2(3.5\pi(\cos(\theta)+\cos(\theta_0)))}{\sin^2(0.7\pi(\cos(\theta)+\cos(\theta_0)))}\,d\theta = \frac{d}{d\theta}2\int_0^\pi \sin(\theta)\frac{\sin^2(3.5\pi\cos(\theta))}{\sin^2(0.7\pi\cos(\theta))}\,d\theta \tag{10}$$

$$\sin(\theta)\frac{\sin^2(3.5\pi(\cos(\theta)+\cos(\theta_0)))}{\sin^2(0.7\pi(\cos(\theta)+\cos(\theta_0)))} = 2\cdot\sin(\theta)\frac{\sin^2(3.5\pi\cos(\theta))}{\sin^2(0.7\pi\cos(\theta))} \tag{11}$$

$$\frac{1}{2}\frac{\sin^2(3.5\pi(\cos(\theta)+\cos(\theta_0)))}{\sin^2(0.7\pi(\cos(\theta)+\cos(\theta_0)))} = \frac{\sin^2(3.5\pi\cos(\theta))}{\sin^2(0.7\pi\cos(\theta))} \tag{12}$$

$$\arcsin^2(1/2)\frac{(3.5\pi(\cos(\theta)+\cos(\theta_0)))}{(0.7\pi(\cos(\theta)+\cos(\theta_0)))} = \frac{(3.5\pi\cos(\theta))}{(0.7\pi\cos(\theta))} \tag{13}$$

$$0.274\frac{(3.5\pi(\cos(\theta)+\cos(\theta_0)))}{(0.7\pi(\cos(\theta)+\cos(\theta_0)))} = \frac{(3.5\pi\cos(\theta))}{(0.7\pi\cos(\theta))} \tag{14}$$

$$\frac{(0.7\pi\cos(\theta))(3.5\pi(\cos(\theta)+\cos(\theta_0)))}{(3.5\pi\cos(\theta))(0.7\pi(\cos(\theta)+\cos(\theta_0)))} = 3.647 \tag{15}$$