**ECE 474 / EXPERIMENT 7**

 **MATLAB CODE (Focusingpram.m)**

% This is receiver plane focusing parameter, radius of curvature of Gaussian beams - 23.04.2012

clear;clc;clf;warning off MATLAB:divideByZero;close all

lamda = 1.51e-6; k = 2\*pi/lamda;zarr = 1:0.1e2:5e3;

Fs = 100;alfas = 1.2e-2;alfa = 1./(k\*alfas^2) + j./(2\*Fs);

%%%% Beam size expression in terms of alpha\_s and F\_s

Fr = -(k^2\*alfas^4\*Fs^2 - 2\*k^2\*alfas^4\*Fs\*zarr + 4\*Fs^2\*zarr.^2 + k^2\*alfas^4\*zarr.^2)./(4\*Fs^2\*zarr - k^2\*alfas^4\*Fs + k^2\*alfas^4\*zarr);

%Fr = - (k^2\*alfas^4 + 4\*zarr.^2)./(4\*zarr);

figure(1)

plot(zarr/1e3,Fr/1e3,'-k','LineWidth',3);

%semilogy(zarr/1e3,Fr/1e3,'-k','LineWidth',2);

set(gcf,'Renderer','Zbuffer');set(gcf,'Color','White');set(gca,'FontSize',14);grid on;

axis ([min(zarr/1e3)\*1 max(zarr/1e3)\*1 -6 0]);

ylabel('\itF\_r \rm\bf in km - Radius of curvature','FontSize',16,'FontWeight','bold');

xlabel('\itz\rm\bf in km - Propagation distance','FontSize',14,'FontWeight','bold')