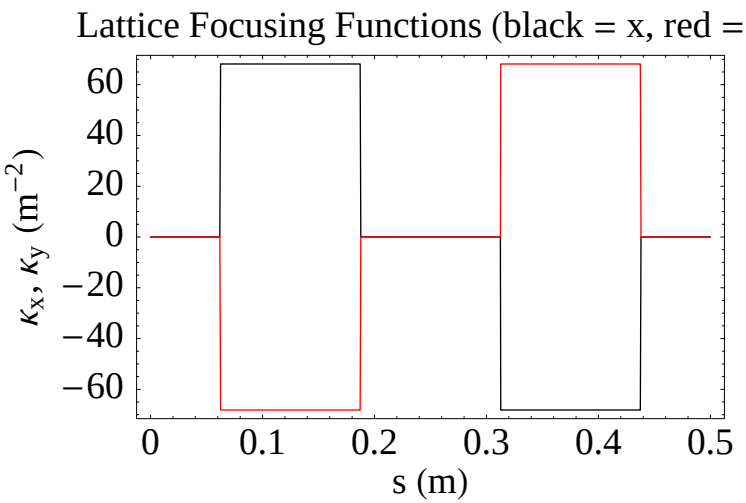
In[1]:= `<< im_example_quad.m`

Matched Envelope Solution −− IM Method

5−23−2006 by lund on linac

Transport Lattice

Lattice Type	Quadrupole
Undepressed Phase Advances [deg/period]	
x-plane, σ_{0x} [deg/period]	120.
y-plane, σ_{0y} [deg/period]	120.
Lattice Period, L_p [m]	0.5
Occupancy, η	0.5
Syncopation Factor, α ($\alpha = 1/2 \Rightarrow$ FODO)	0.5
Max Focusing Strength, Max[κ_x, κ_y], [1/m^2]	68.147

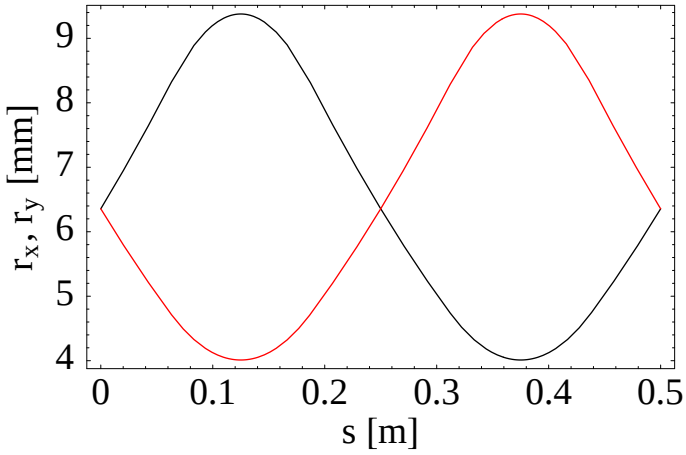


Beam Properties

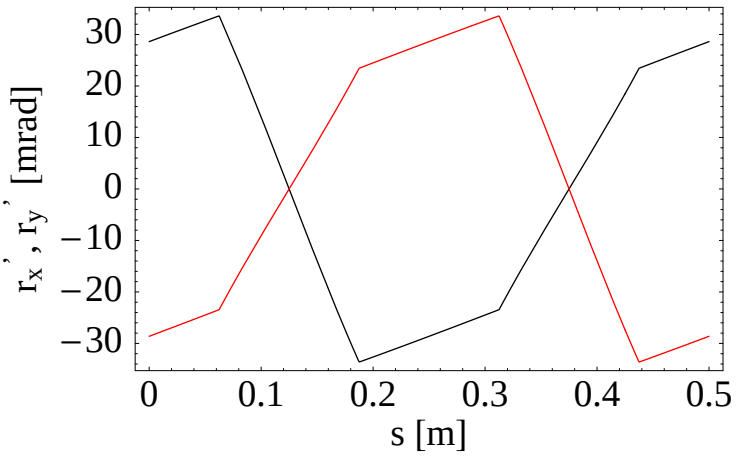
Dimensionless Perveance, Q	$5. \times 10^{-4}$
RMS Edge Emittances [m-rad]:	
ε_x	2.7726×10^{-5}
ε_y	2.7726×10^{-5}
Depressed Phase Advances [deg/period]	
x-plane, σ_x [deg/period]	24.
y-plane, σ_y [deg/period]	24.
Tune Depressions:	
σ_x / σ_{0x}	0.2
σ_y / σ_{0y}	0.2

Matched Solution

Matched Envelope Functions (black = x, red = y)



Matched Envelope Angles (black = x, red = y)



	x-Horizontal	y-Vertical
Radii, $r_x = 2\langle x^2\rangle^{1/2}$, $r_y = 2\langle y^2\rangle^{1/2}$:		
Avg (Lattice Period), $\overline{r_x}$, $\overline{r_y}$ [mm]	6.5204	6.5204
Max, Max[r_x], Max[r_y] [mm]	9.3774	9.3774
s-locations of Maxs [mm]	125.	375.
Min, Min[r_x], Min[r_y] [mm]	4.0108	4.0108
s-locations of Mins [mm]	375.	125.
Angles, r_x', r_y' :		
Max, Max[r_x'], Max[r_y'] [mrad]	33.621	33.621
s-locations of Maxs [mm]	62.5	312.5
Min, Min[r_x'], Min[r_y'] [mrad]	−33.621	−33.621
s-locations of Mins [mm]	187.5	437.5
Matching Conditions:		
Radii, $r_x[0]$, $r_y[0]$ [mm]	6.3559	6.3559
Angles, $r_x'[0]$, $r_y'[0]$ [mrad]	28.617	−28.617

Average Radius Measures:

$\sqrt{r_x\, r_y}$ [mm]	6.2547
$(r_x + r_y)/2$ [mm]	6.5204

Matched Solution −− Numerical Parameters

Parameterization Case	1
Specified Fractional Tolerance	$1.\times 10^{-6}$
Achieved Fractional Tolerance	9.456×10^{-7}
Iterations Needed	7
CPU Time for Solution [sec]	4.33