

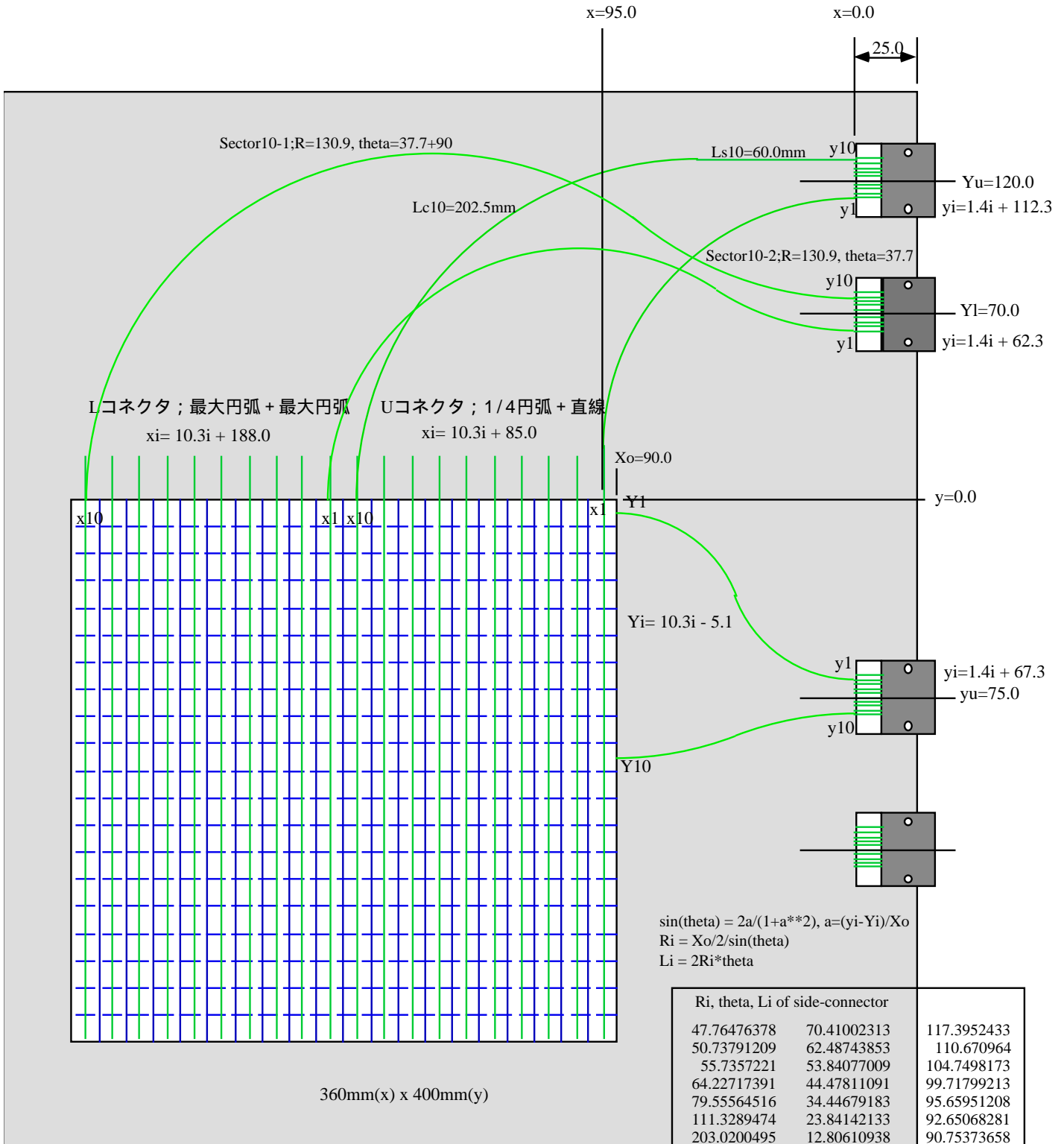
U-connector WLS fiber length ;  $L_i = X_i + (\pi/2-1)*Y_i$  if  $X_i > Y_i$   
 $L_i = Y_i + (\pi/2-1)*X_i$  if  $X_i < Y_i$

L-connector WLS fiber length ;

$X_i = R_i*(2*\sin(\theta_i-1))$ ,  $R_i$  = radius of optimum circle  
 $Y_i = R_i*(2*\cos(\theta_i-1))$ ,  $\theta_i$ =sector opening angle  
 set  $t=\sin(\theta_i)$ ,  $a=Y_i/X_i$  then  
 $a = (2\cos-1)/(2\sin+1) = (2\sqrt{1-t^2}-1)/(2t+1)$   
 $4(a^2+1)t^2 + 4a(a+1)t + (a+1)^2 - 4 = 0$   
 $t = (\sqrt{3a^2-2a+3} - a(a+1))/2(a^2+1)$   
 and  $\theta_i$ ,  $X_i$ ,  $Y_i$ ,  $R_i$  obtained  
 $L_i = R_i*\pi/2 + 2R_i*\theta_i$

| Ri & theta & WLS-length for L-connector |             |             |
|---|-------------|-------------|
| 94.62461209                             | 33.21782406 | 258.3558032 |
| 98.61445492                             | 33.89365082 | 271.5757646 |
| 102.6188189                             | 34.51120125 | 284.8155558 |
| 106.6357376                             | 35.07760667 | 298.0727269 |
| 110.6635819                             | 35.59889544 | 311.3452125 |
| 114.7009914                             | 36.08019532 | 324.6312596 |
| 118.7468214                             | 36.52589362 | 337.929371  |
| 122.8001017                             | 36.93976471 | 351.2382606 |
| 126.8600052                             | 37.3250724  | 364.5568182 |
| 130.9258223                             | 37.68465264 | 377.8840796 |

| length for U-connector |
|------------------------|
| 168.09724              |
| 175.37648              |
| 182.3982               |
| 193.49732              |
| 204.59644              |
| 215.69556              |
| 226.79468              |
| 237.8938               |
| 248.99292              |
| 260.09204              |



| Ri, theta, Li of side-connector |              |             |
|---------------------------------|--------------|-------------|
| 47.76476378                     | 70.41002313  | 117.3952433 |
| 50.73791209                     | 62.48743853  | 110.670964  |
| 55.7357221                      | 53.84077009  | 104.7498173 |
| 64.22717391                     | 44.47811091  | 99.71799213 |
| 79.55564516                     | 34.44679183  | 95.65951208 |
| 111.3289474                     | 23.84142133  | 92.65068281 |
| 203.0200495                     | 12.80610938  | 90.75373658 |
| 1687.8                          | 1.527793349  | 90.01066629 |
| -264.912013                     | -9.780105317 | 90.43854425 |
| -126.1379518                    | -20.90082605 | 92.0274958  |