Au Thickness
DIFFRACT Model

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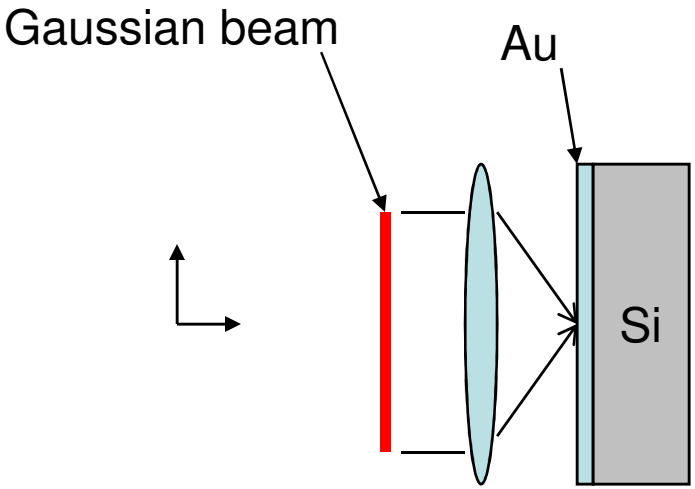
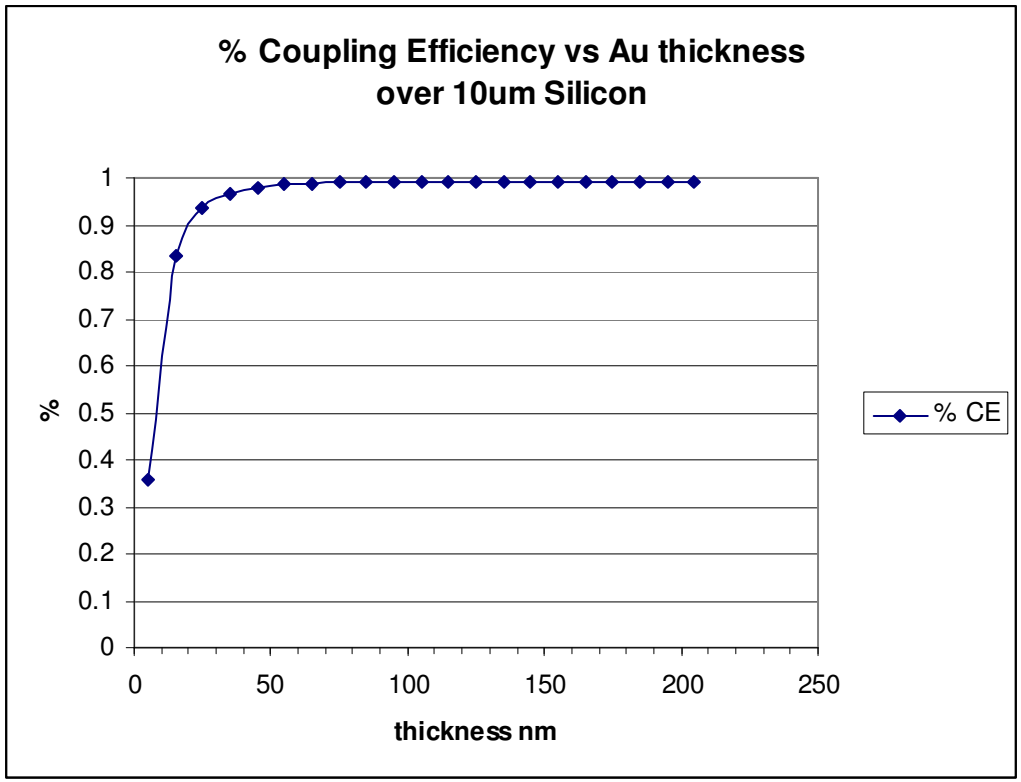
DIFFRACT Model



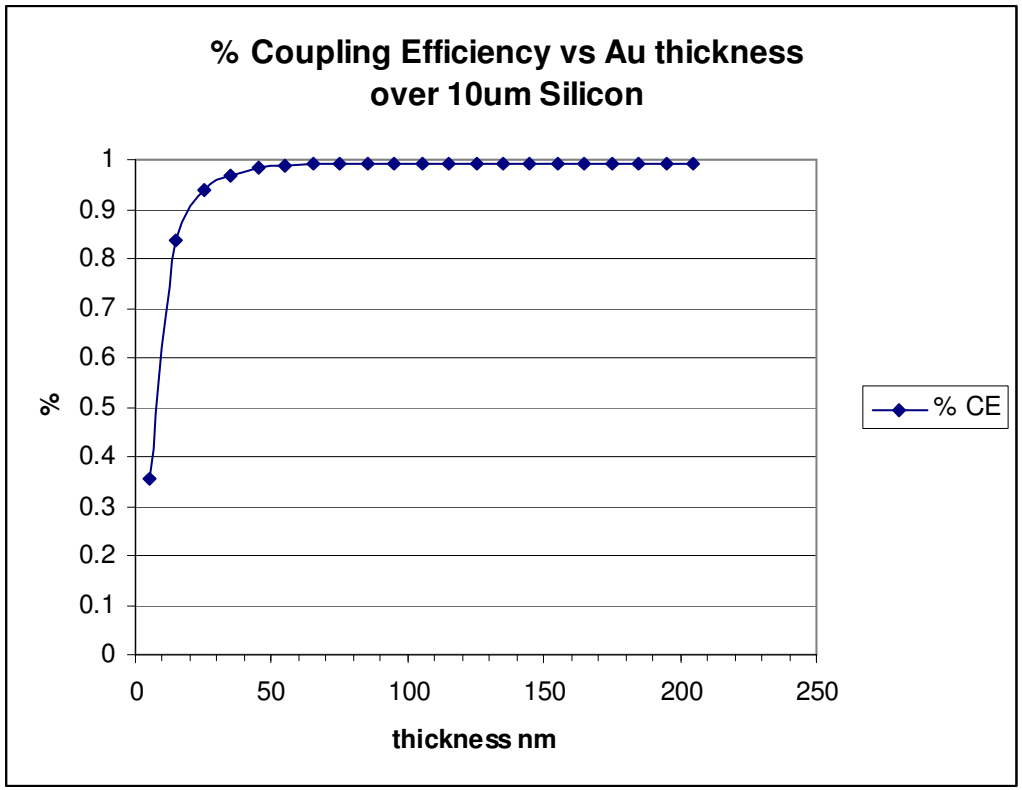
- In the DIFFRACT model a Gaussian beam is focused to a 1/e^2 diameter of 30um on a Au film covering a Silicon substrate. In the model the reflected beam is collected in a collimating lens and analyzed for total power.
- The values of n & k for Au and Si were taken as the bulk value from the CRC Handbook of Physics and Chemistry at a wavelength of ~1550nm.

Gold Thickness @ l = 1550nm



- Angle of incidence 2 deg.
- Limiting value 99.1% reached at ~105nm

Gold Thickness @ l = 1550nm



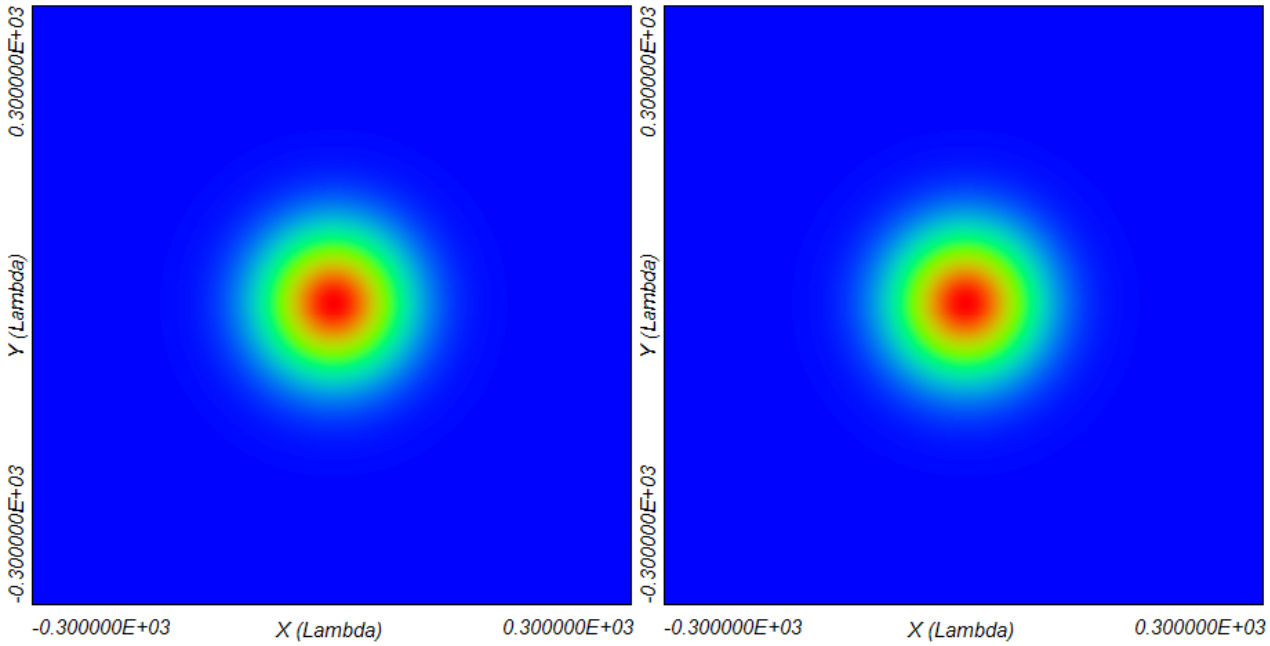
- Angle of incidence 0 deg.
- Limiting value 99.2% reached at ~95nm

Conclusion

- Based on the DIFFRACT simulation the Au coating thickness should be specified as:

  Coating thickness: > 115nm

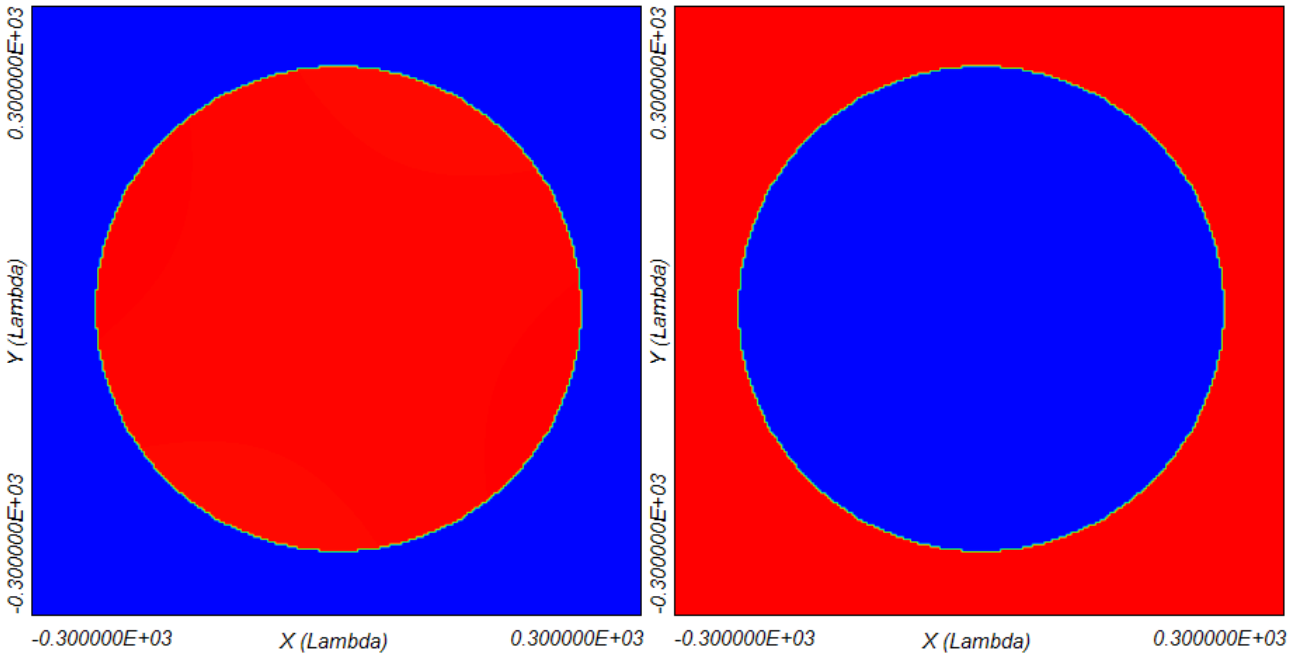
- The upper bound on thickness will be constrained by the specification of mirror flatness, along with the cost and process time of coating.



IXmin= 0.0000E+00
IXmax= 0.3158E-04

IYmin= 0.0000E+00
IYmax= 0.3158E-04

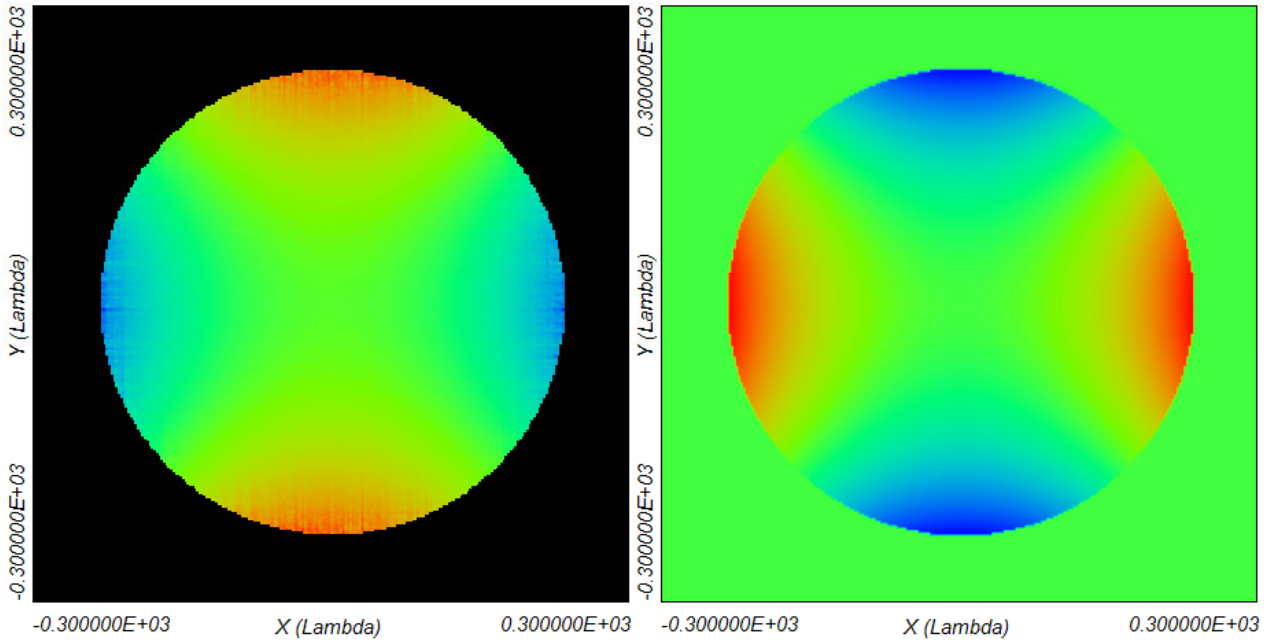
- Intensity of reflected spot at collimator lens (case h=120nm).



PXmin= 0.000000
PXmax= 12.730933

PYmin= -167.383240
PYmax= 0.000000

- Phase of reflected spot at collimator lens (case h=120nm)



RTmin= -45.000946
RTmax= -44.999161

ELmin= -0.039238
ELmax= 0.039379

- Polarization of reflected spot at collimator lens (case h=120nm)