

Rayleigh Criterion



Twice the resolution limit

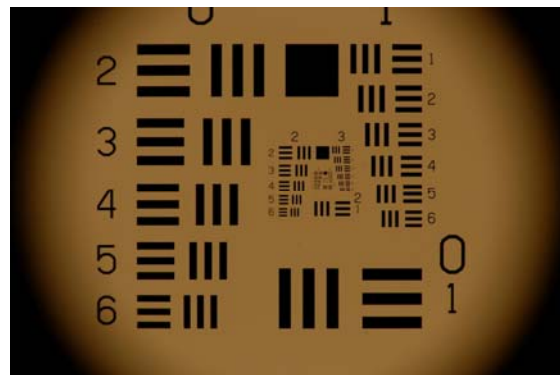


At the resolution limit



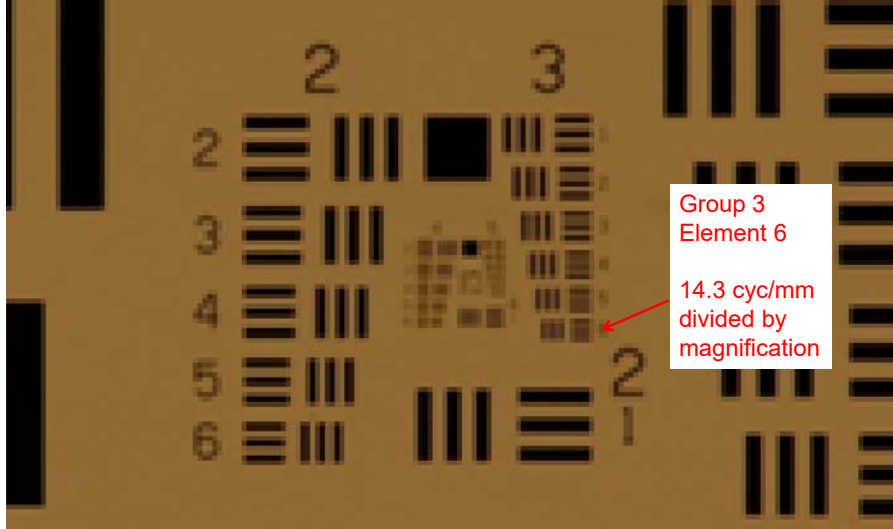
Half the resolution limit

1.6.1 Resolution Targets 1951 USAF Target

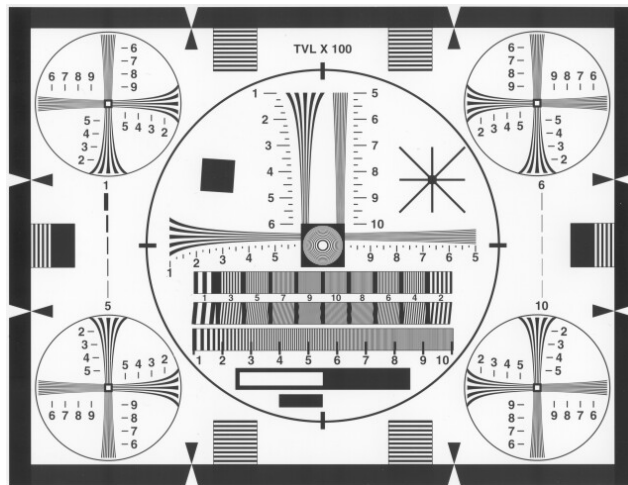


Number of Line Pairs / mm in USAF Resolving Power Test Target 1951												
		Group Number										
Element	-2	-1	0	1	2	3	4	5	6	7	8	9
1	0.250	0.500	1.00	2.00	4.00	8.00	16.00	32.0	64.0	128.0	256.0	512.0
2	0.280	0.561	1.12	2.24	4.49	8.98	17.95	36.0	71.8	144.0	287.0	575.0
3	0.315	0.630	1.26	2.52	5.04	10.10	20.16	40.3	80.6	161.0	323.0	645.0
4	0.353	0.707	1.41	2.83	5.66	11.30	22.62	45.3	90.5	181.0	362.0	—
5	0.397	0.793	1.59	3.17	6.35	12.70	25.39	50.8	102.0	203.0	406.0	—
6	0.445	0.891	1.78	3.56	7.13	14.30	28.50	57.0	114.0	228.0	456.0	—

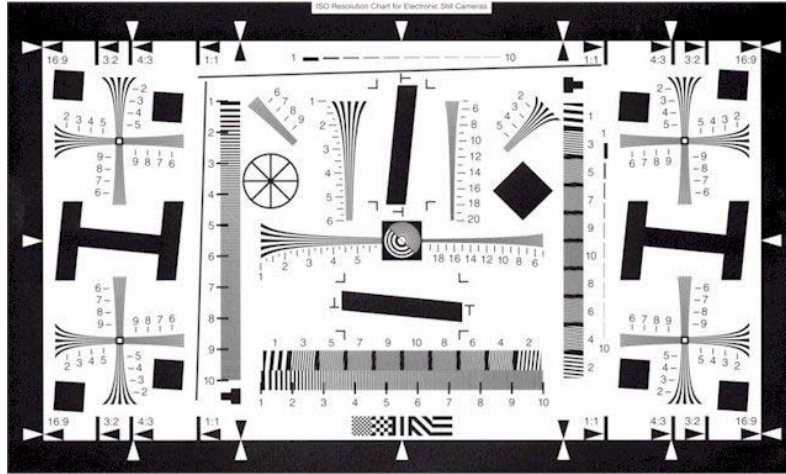
1951 USAF Target



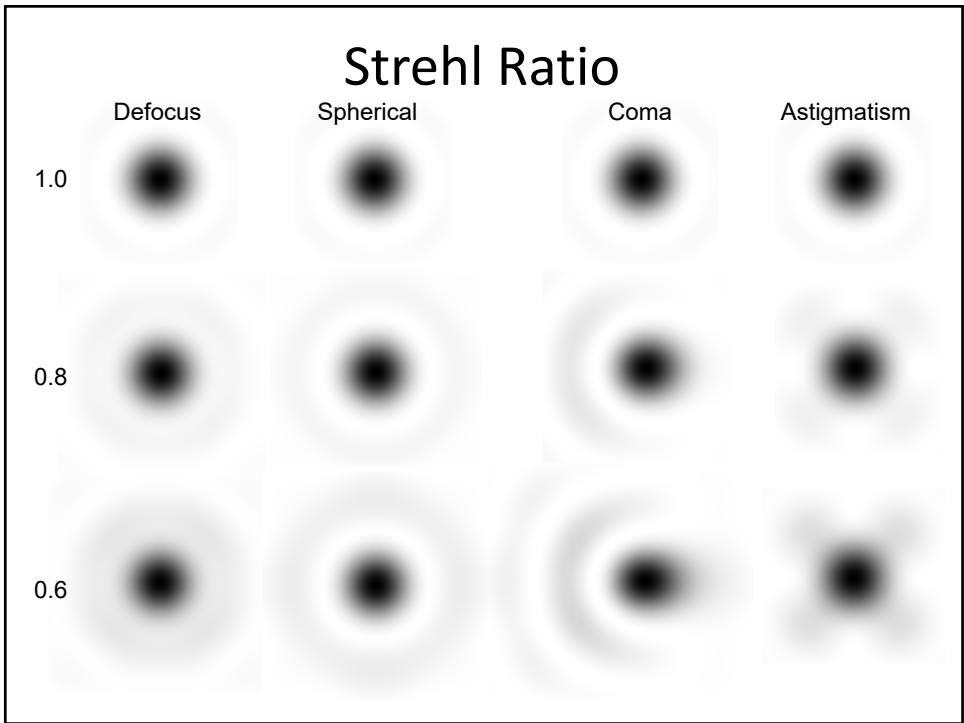
IEEE Resolution Target



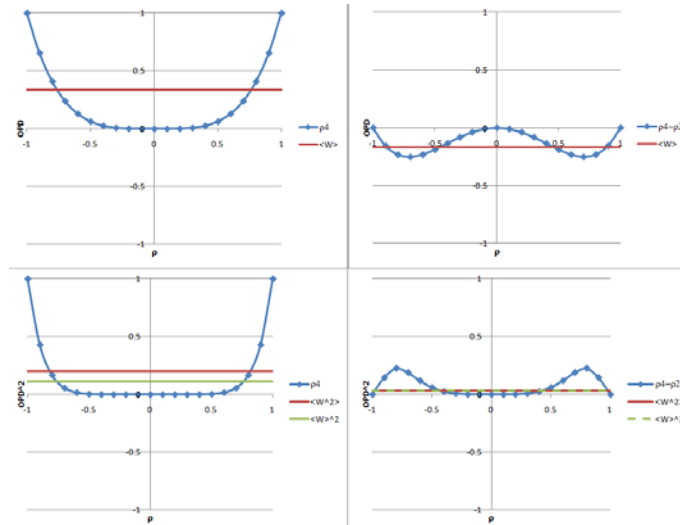
ISO Resolution Target



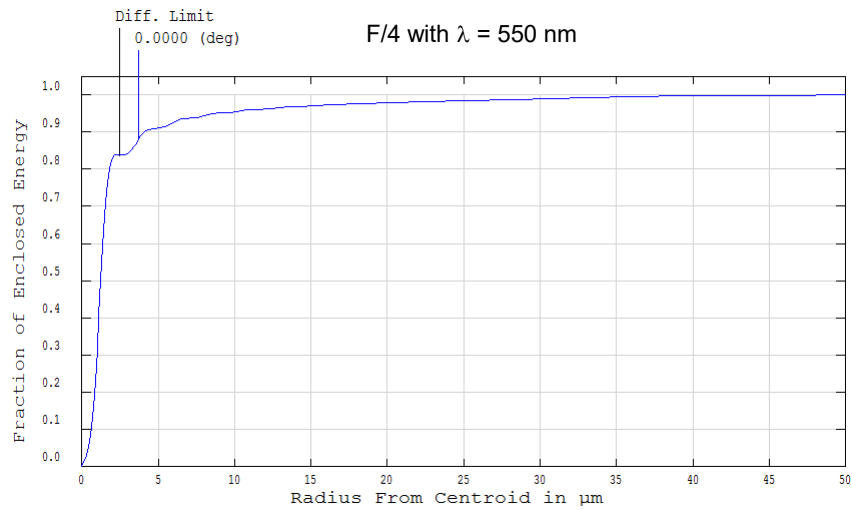
Strehl Ratio



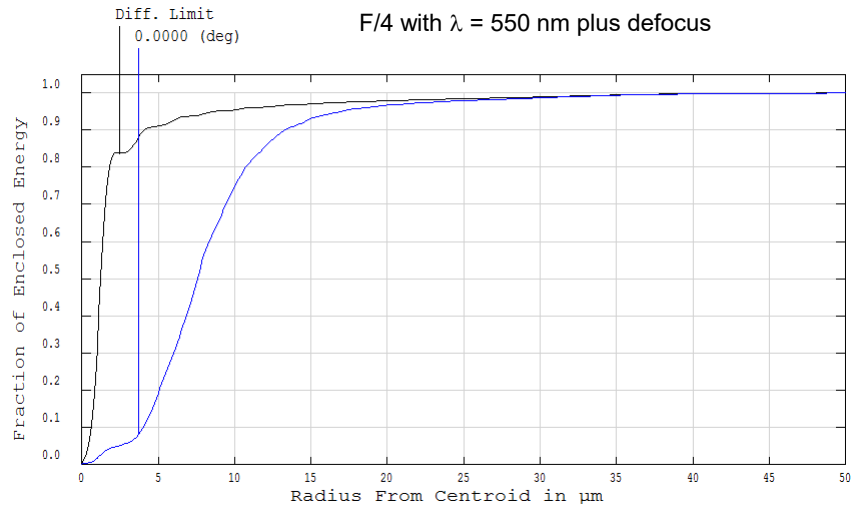
Wavefront Variance Examples



Encircled Energy

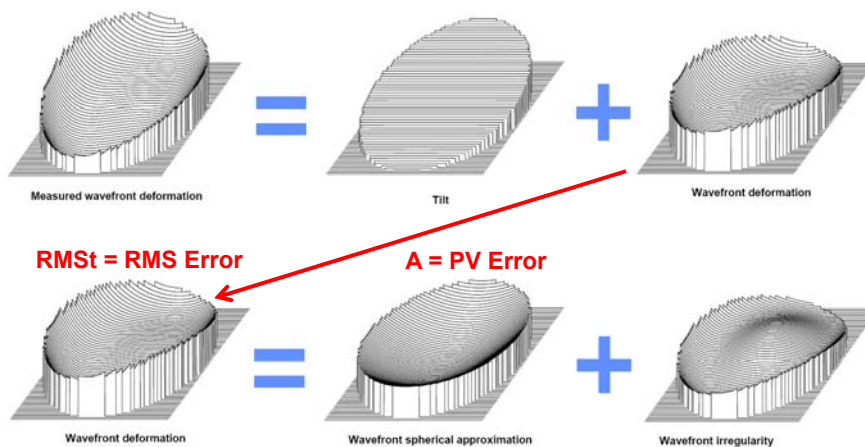


Encircled Energy



ISO10110-14 Wavefront Deformation

To understand the values A, B and C and RMSx in the Surface Form Tolerance, we need to understand the wavefront shape.



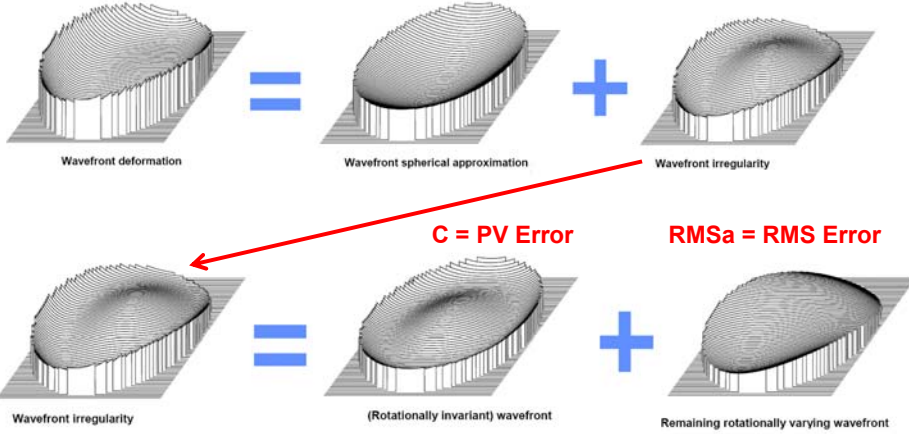
ISO10110-14 Wavefront Deformation

We can further break down wavefront irregularity

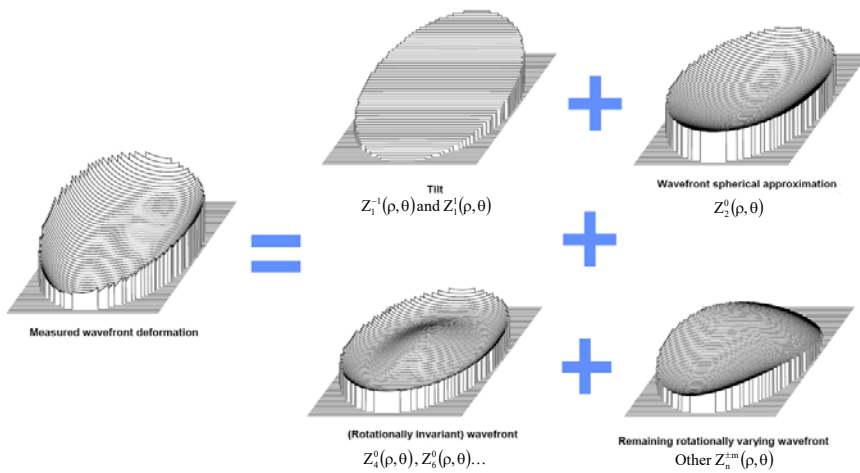
RMS_t = RMS Error

A = PV Error

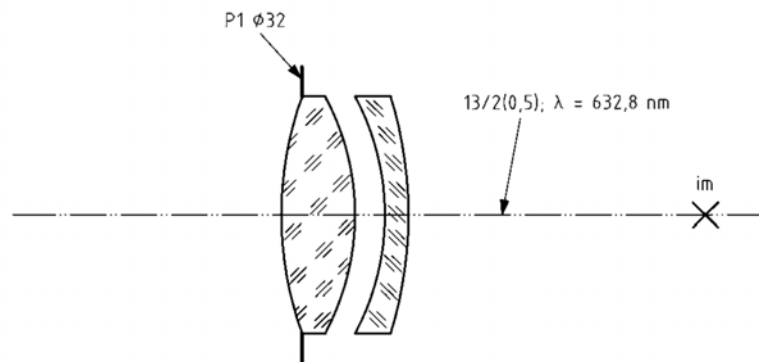
**B = PV Error
RMS_i = RMS Error**



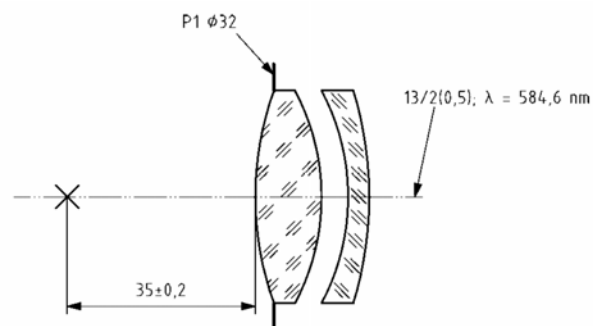
ISO10110-14 Wavefront Deformation



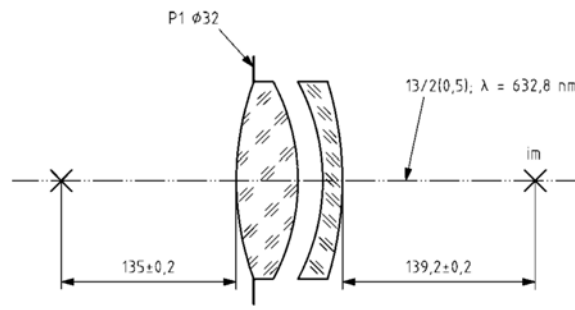
ISO10110-14 Wavefront Deformation



ISO10110-14 Wavefront Deformation



ISO10110-14 Wavefront Deformation



Contrast vs. Resolution

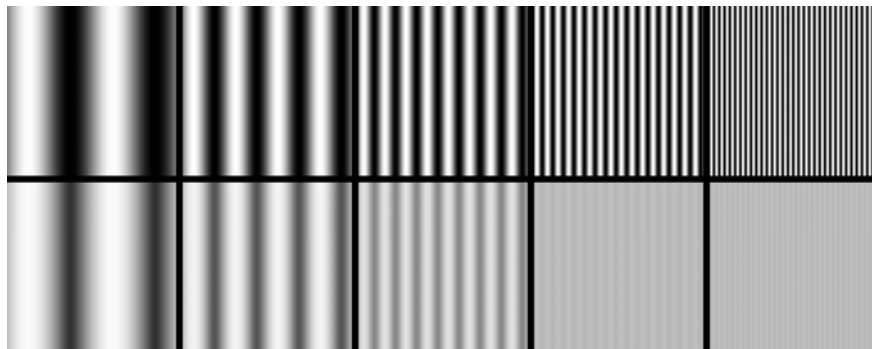


Contrast vs. Resolution



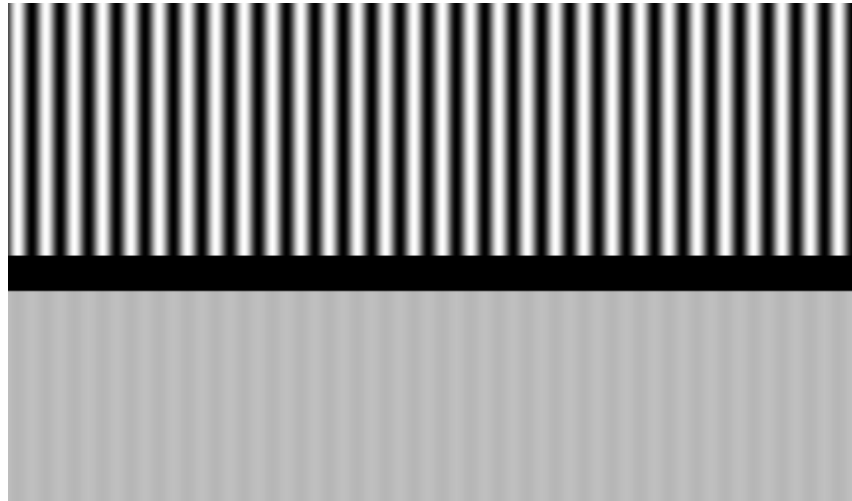
Modulation Transfer Function

Input 100% Contrast



Output

MTF – Contrast Reversal

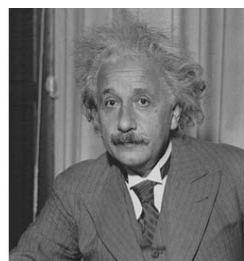


Phase is Important

Apollo Lander



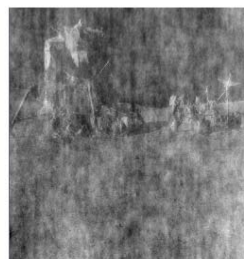
Albert Einstein

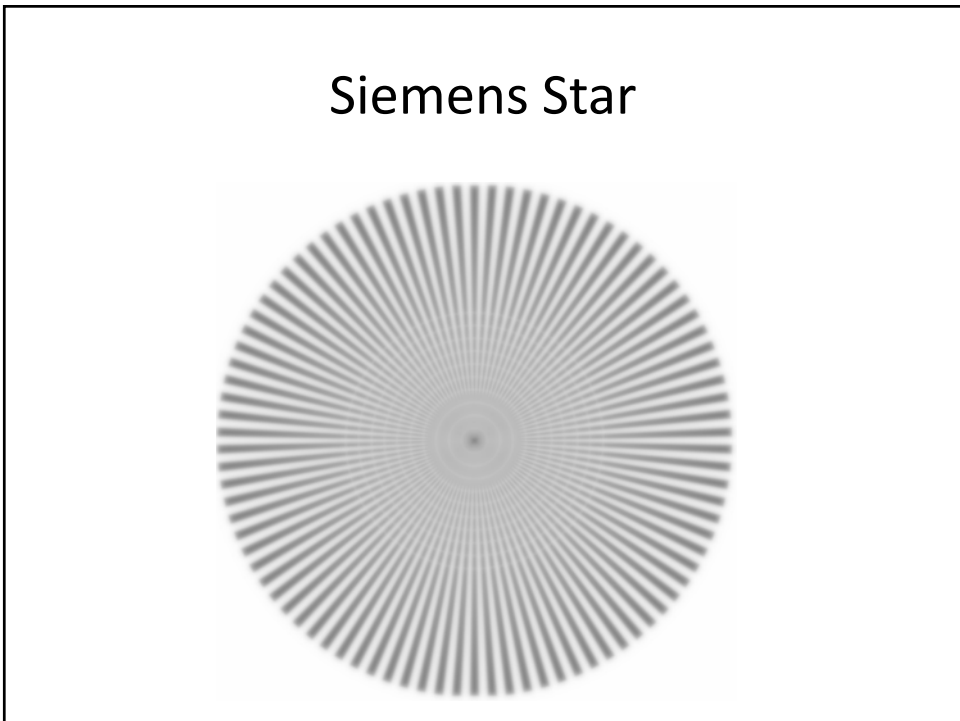
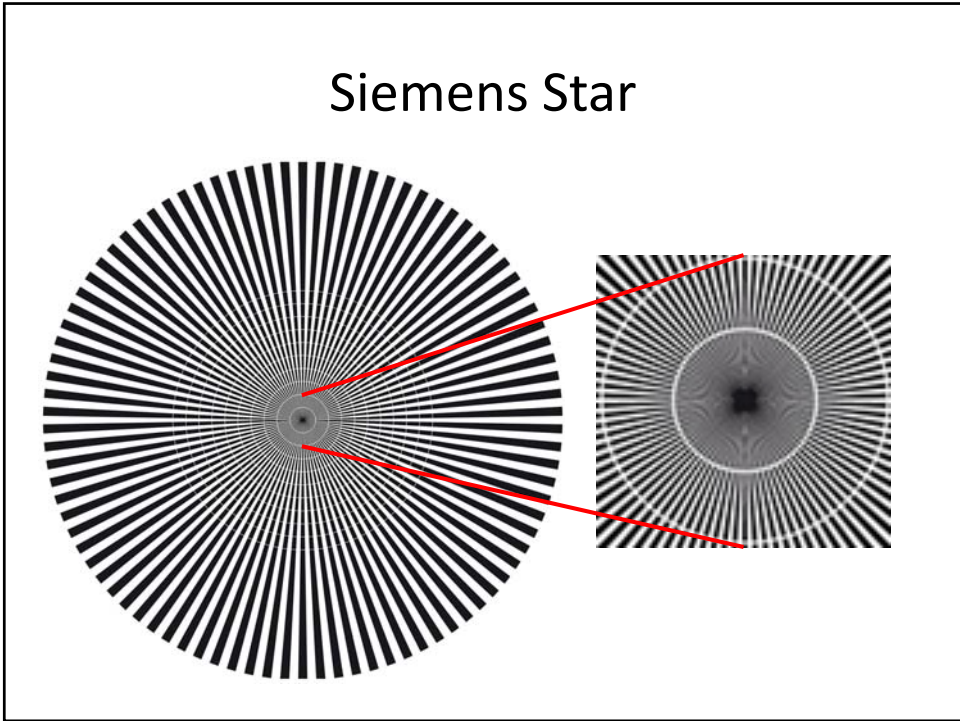


Apollo Modulus
+
Einstein Phase



Einstein Modulus
+
Apollo Phase





Siemens Star

