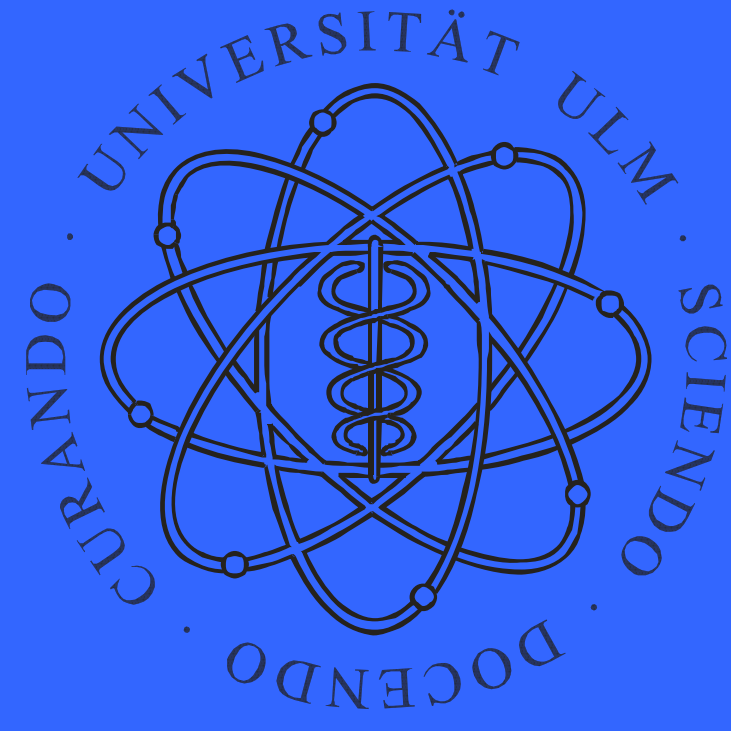
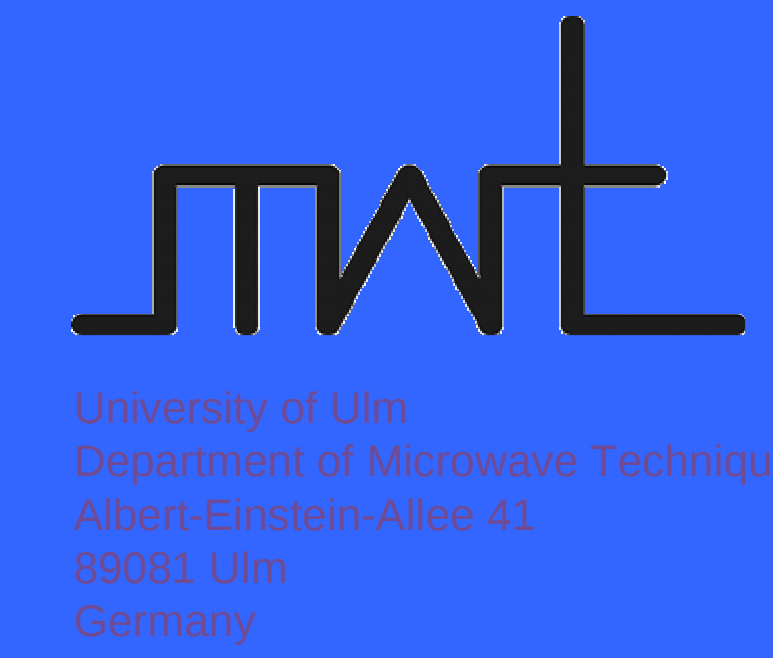




A NOVEL MM-WAVE DUAL REFLECTOR ANTENNA WITH OMNIDIRECTIONAL RADIATION PATTERN

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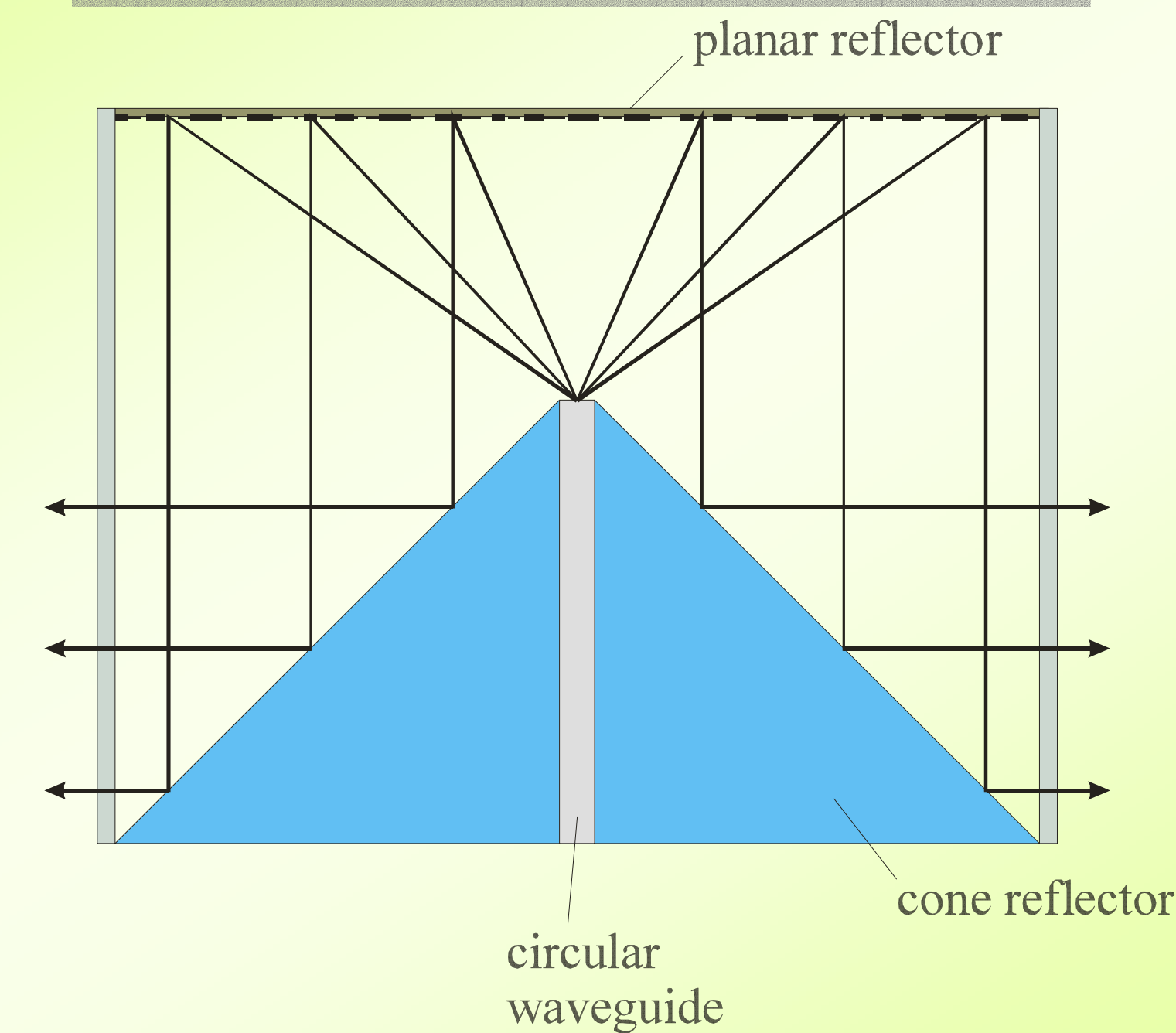
Antenna Concept

- mm-wave antenna (58 GHz)
- omnidirectional azimuth coverage
- narrow beamwidth in elevation
- linear polarization (switchable between horizontal and vertical polarization) or circular polarization (switchable between right- and left-hand polarization)

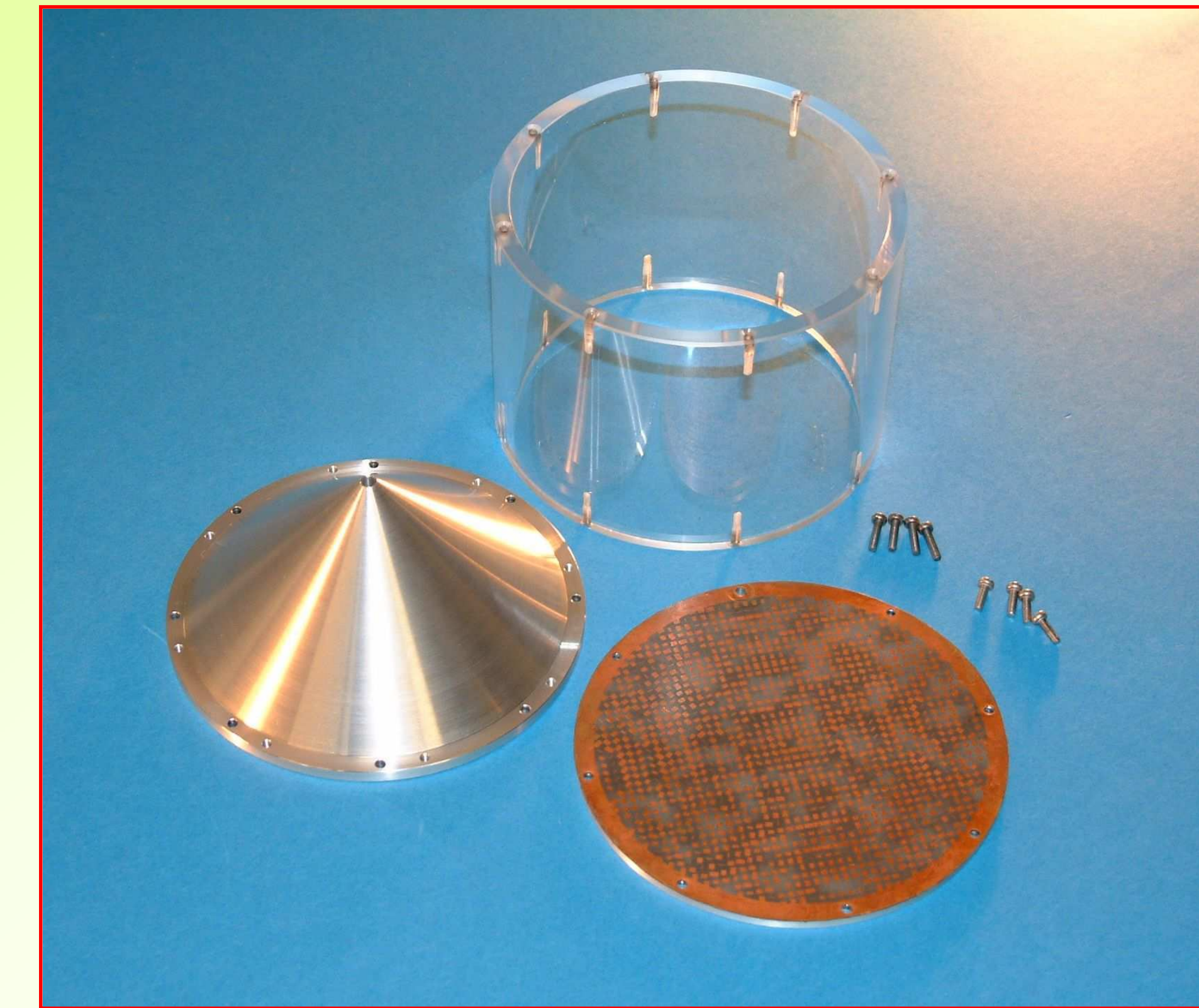
Antenna Principle

- circular waveguide feed with fundamental TE_{11} -mode (linear polarization)
- planar reflector on the top
- cone reflector at the bottom
- acryl glass tube as spacer between reflectors

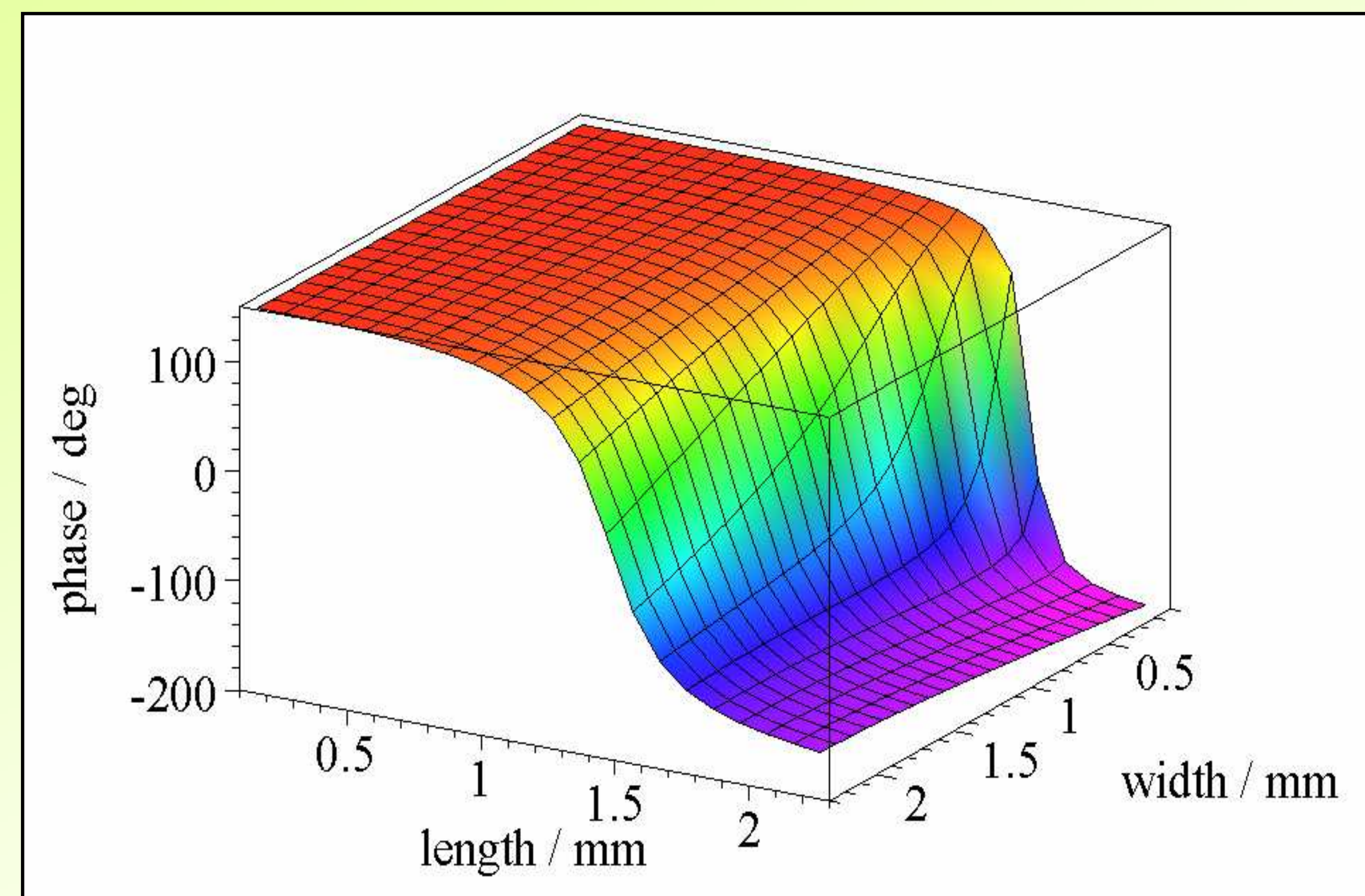
Basic principle of the dual reflector antenna



Photograph of the parts of the omnidirectional antenna

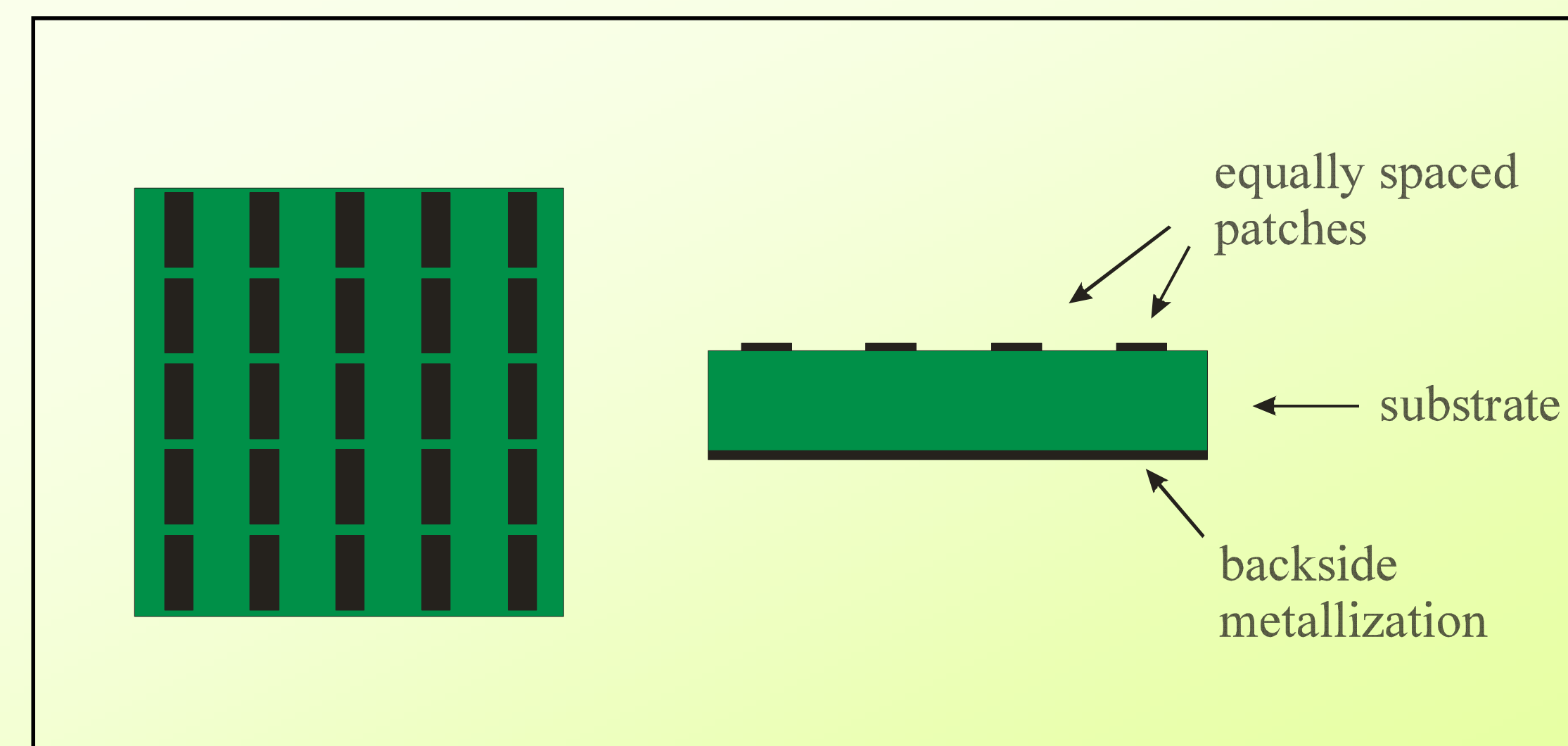


The Planar Reflector



Reflection phase angle of a plane wave reflected from a periodic array of printed dipoles. (Frequency 58 GHz, substrate thickness 0.254 mm, dielectric constant 2.2, dipole grid spacing 2.4 mm, normal incidence of the wave).

- printed patches with backside metalization
- size of rectangular patches on the substrate determine the phase angle of the reflected waves
- phase angles in a range of 320° can be set
- all reflection phase angles, with a gap of $\pm 20^\circ$, can be adjusted by the size of the elements.



Photograph of the assembled omnidirectional antenna

