In the scope of a project founded by the Swiss federal office of energy, we study a microstructured glazing for the optimised usage of available solar radiation throughout the year. To maximise natural light availability in a room, the glazing redirects light. For a seasonal thermal control the glazing has angular dependent transmission ratio: at angles corresponding to the elevation of the sun in winter, the transmission is maximised while at angles corresponding to the elevation of the sun in summer, transmittance is minimised. Also the glassing has to remain relatively transparent for aesthetic reasons.

A geometrical shape achieving these objectives was designed and simulated. In the scope of this project, the student will study a method for the fabrication of the corresponding micro-structures. To obtain the relatively large size and high aspect ratio structures with 200 micrometer period and 500-600 micrometer depth, novel ways of microstructuring shall be explored. One option is engraving of a soft material using LIGA shaped stencils followed by electrodeposition of metal (somewhat like the technique used for vinyl master production). This option shall be compared to common lithographic methods.

Project Challenges:
- Choice of materials: resin and stencil.
- Structure conformity: profilometer measures to compare objective and result.
- Study of alignment requirements.
- Good optical surface quality for reflective properties.

Candidate's Profile:
- Student in physics, material science or microengineering.
- Motivation for experimental work.
- Experience with MEMS, MOEMS or other field of microstructuration is an advantage.
- Basic knowledge of material science

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