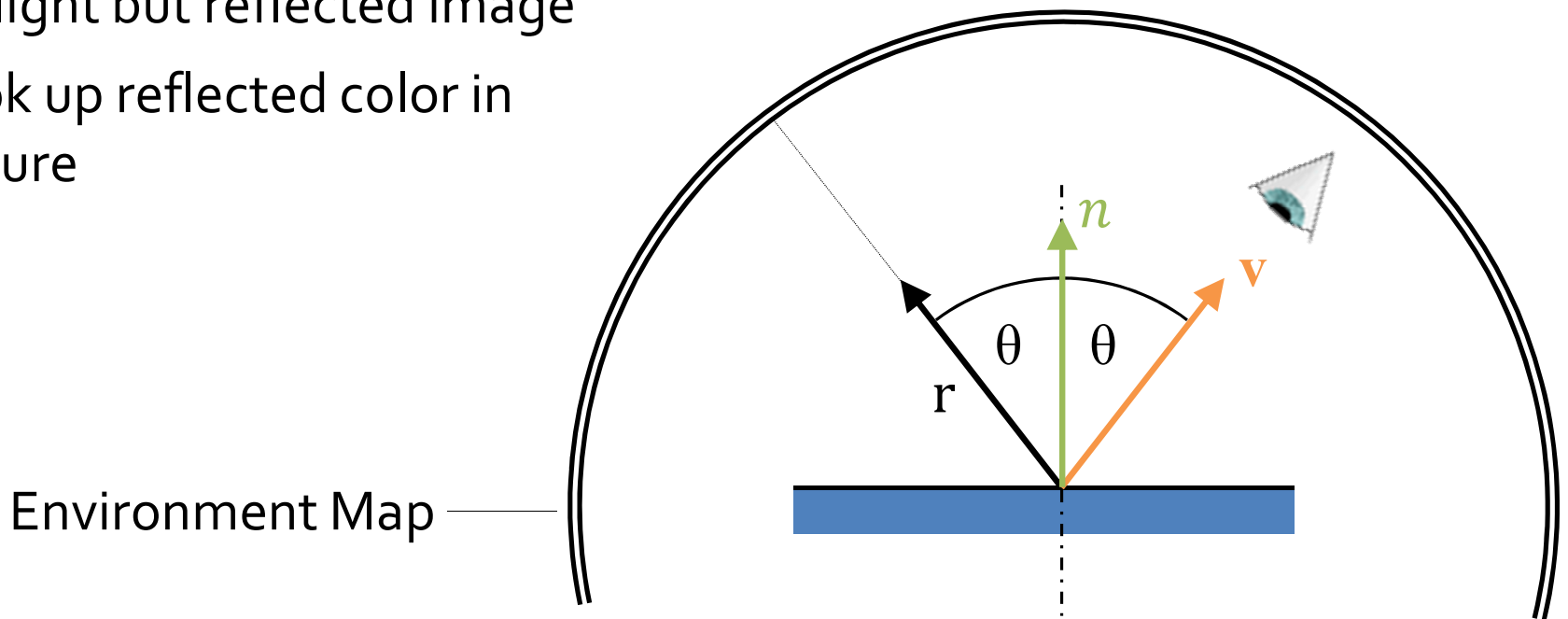


Image Based Lighting

Environment Mapping

- Better specular reflections
- Not highlight but reflected image
- Idea: Look up reflected color in 360° texture



Environment Mapping – 360° Texture Types



Cube map



LongLat map

Environment Mapping – 360° Texture Types



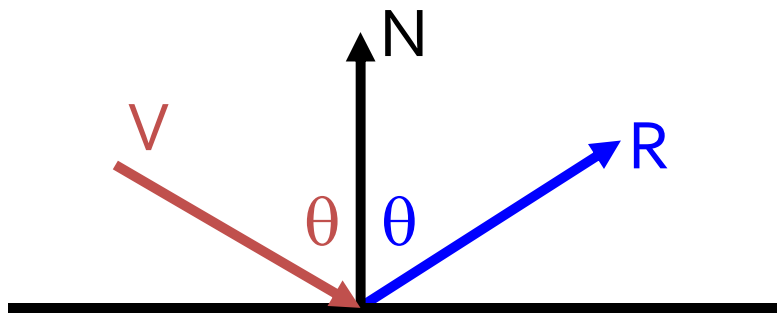
Sphere map



Dual-paraboloid map

Reflective Environment Mapping

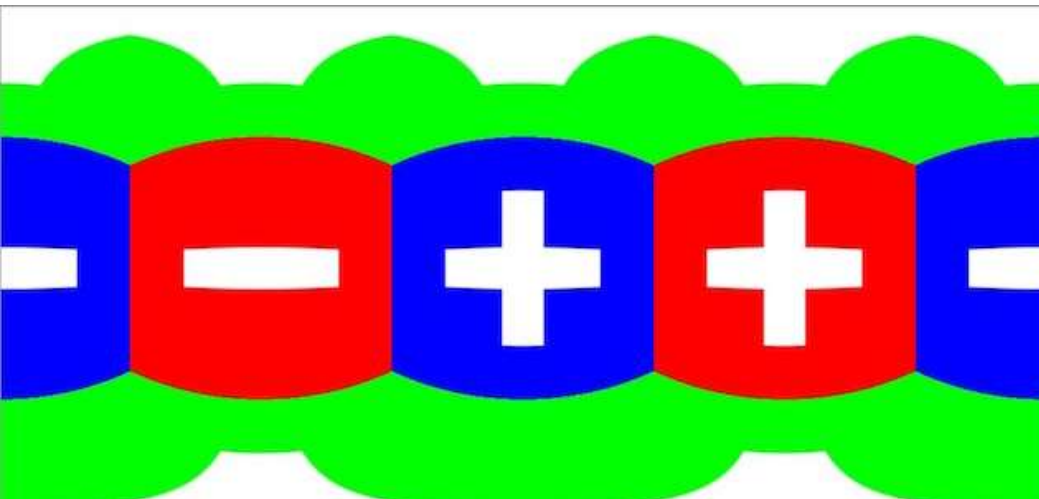
- Angle of incidence = angle of reflection

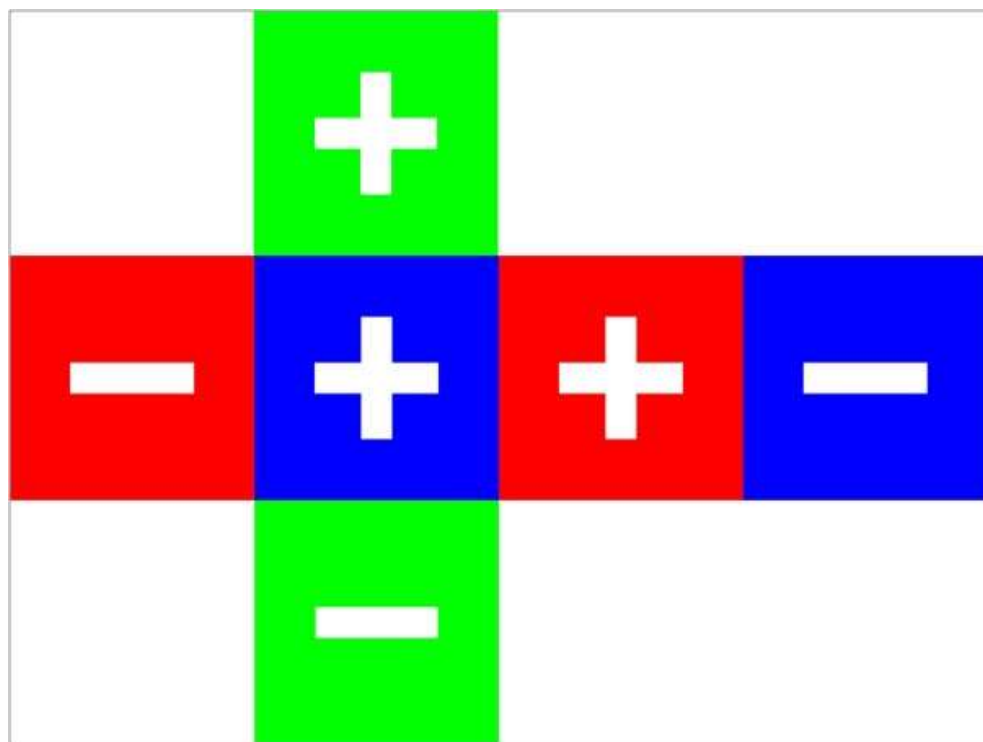


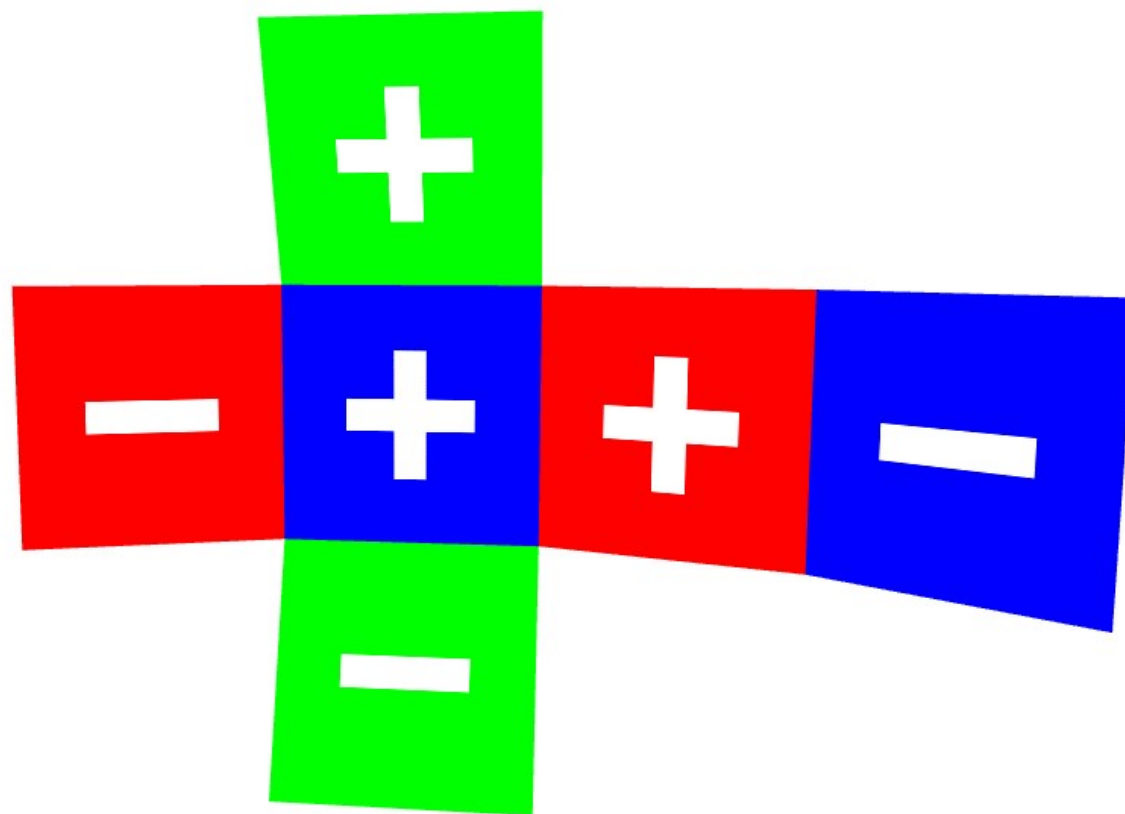
$$R = V - 2 (N \cdot V) N$$

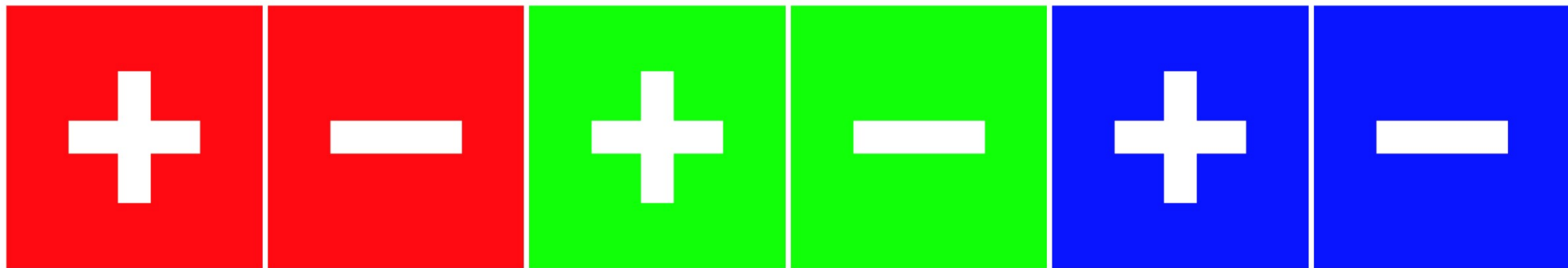
$= \text{reflect}(V, N)$

V and N normalized!



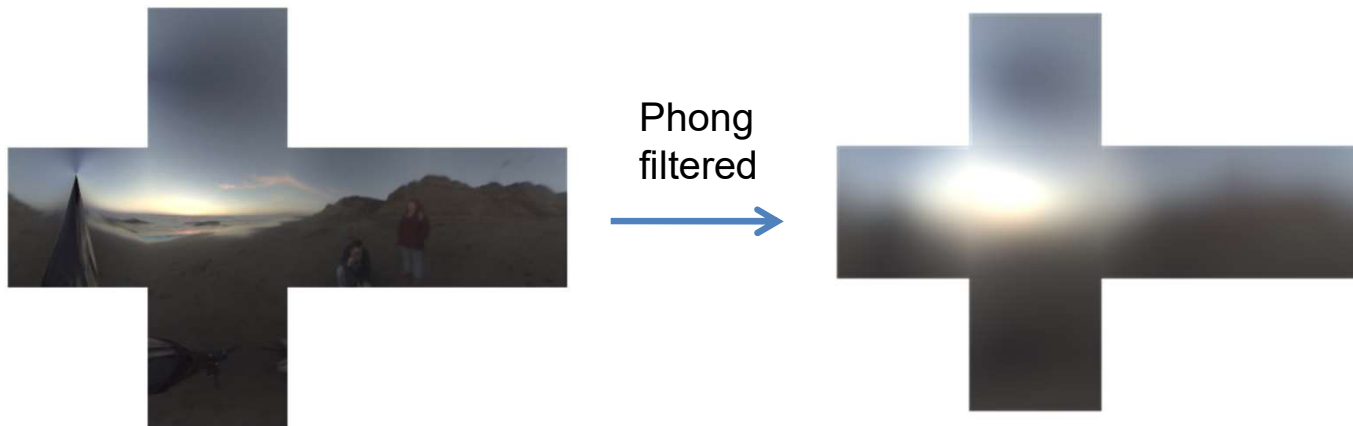






Specular Environment Mapping

- We can pre-filter the environment map
 - Equals specular integration over the hemisphere
 - Phong lobe (\cos^n) as filter kernel
 - **textureLod;level** according to glossiness
 - R as lookup





Refractive Environment Mapping

- Use refracted vector for lookup:
 - Snells law:

$$\eta_1 \sin \theta_I = \eta_2 \sin \theta_T$$

