

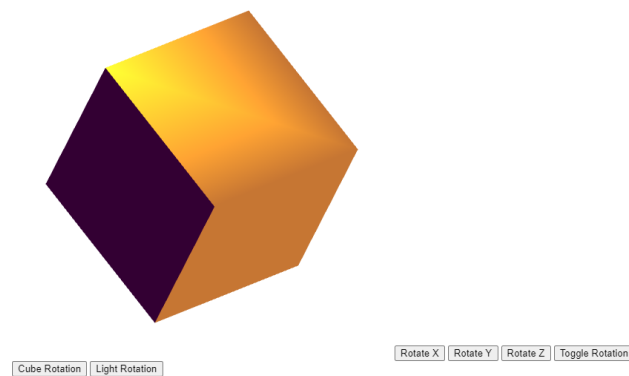
Lab 16

Run 06/shadedCube.html and 06/shadedCube2.html . Do you see any Mach bands?



Yes, in 06/shadedCube.html we are able to see a Mach band along the edge between the two triangles of a face. As we discussed, the explanation is that there is a “single normal for each triangle, a different halfway vector for the specular term and for each vertex... so the specular term will vary across the surface as the rasterizer interpolates the vertex shader.” But there doesn’t seem to be any Mach bands in 06/shadedCube2.html . Is this due to the shading scheme, or the light source, or an artifact of the rotation?

Let’s explore, and start by comparing 06/shadedCube2.js to Lab16MachBands.js . What is the one difference? Ans: The `modelViewMatrix` has been hardcoded. Using the console log, the current entries of the model-view matrix from 06/shadedCube.html, when it was showing a Mach band are used to initially display the cube. Once the rotation starts, mach bands are clearly visible. So the mach bands are due to our shading techniques, and not the light source or an artifact of the rotation. The shading techniques cause visible differences at the edges of polygons.



Finally, spend some time reviewing the code in Lab16MachBands.html . Pay close attention to the lighting calculations in the vertex shader. These are fairly standard, and you can use these commands to add shading to other scenes.