## Möbius Strip

The Möbius Strip can be defined parametrically by:

$$x(t) := aa(\cos(v) + u\cos(v/2)\cos(v)),$$
$$y(t) := aa(\sin(v) + u\cos(v/2)\sin(v)),$$
$$z(t) := aa\,u\sin(v/2).$$

It is the most famous *one-sided* surface. Try from the view-menu "Distinguish Sides By Color", and you will see that the sides are not distinguished—because there is only one. Follow the band around.

Möbius Strips can be found on all non-orientable surfaces. To see it on the Klein Bottle, select "Set t,u,v Ranges" from the Settings menu and then set umin to - 0.4 and umax to + 0.4. On the Boys surface there are even two different kinds of Möbius bands. To see one with *three* halftwists change umin to 0.9. This gives a band with the "equator" of the Boys surface as its center line. Bands with meridians as their center curves are ordinary Möbius bands. To see one, change the u,v-ranges to umin = -0.998, vmin = 6.1. This is perhaps best viewed using "Distinguish Sides

By Color" from the view-menu. (On the Steiner surface and on the Crosscap one can also find Möbius Strips. These however are not embedded and therefore not so recognizable—in Math jargon they are not immersed, and have a singularity on the Möbius band.)

H.K.