For the purposes of this “toy” problem, I will assume that impactors hit isotropically over the Moon’s surface. There will be some large number of “impactors” N, the value of which I will save (this will correspond to some flux per some arbitrary unit time per some arbitrary unit area). Each impact will produce one ejecta particle which will come off with no preferred azimuth, and with a velocity and elevation distribution given below. I will designate various “targets” on the surface of the Moon – some hemispherical domes and some spheres of various sizes – and record all particles (along with angle and speed and source region) that hit the surface.

For the distribution in velocity, I will simply have a flat distribution between v = 0 and v = vesc. It will also be isotropic in azimuth (f). In order to avoid some problems at low elevation, I will use a distribution of ejecta elevations that is proportional to cos(*g* ) (*g* being angle from zenith), such that the ejecta flux is a maximum at zenith, and drops to zero for horizontal ejecta (there will be no ejecta at elevations below zero!).

So the normalized distribution (over a hemisphere) will be

such that

The projected of the cross-sectional area (of the convex part) of a hemisphere (radius r) is easy to calculate (it even works for *g* > 90°, corresponding to particles ascending from the surface)