

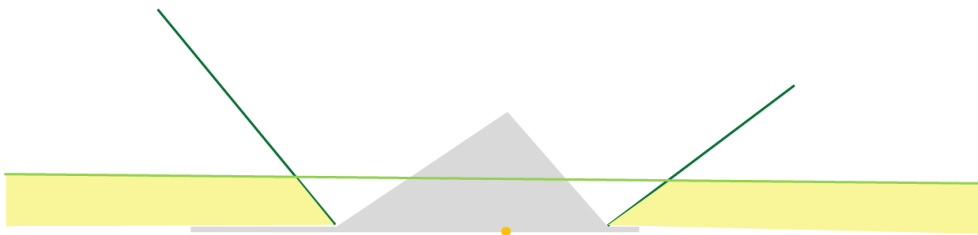
## Spatial Databases and GIS

### Solutions for Sheet I I

#### Exercise 1 (Geometric Errors, Radar)

1. Where do you have to be in the picture below to capture a radar image without foreshortening and without layover?

*The distance from the antenna to the top of the mountain has to be equal or longer than the distance to the projection of this point to the ground (orange point in the picture), to capture an image without foreshortening. Thus you may not be higher than half the height of the mountain (below the light green line). To avoid layover the local incidence angle has to be positive, if you take a picture right of your position, negative if you take one to your left (below the dark green lines). So you might be anywhere in the yellow area. However you are only able to capture one side of the mountain as the other side is shadowed.*



2. Where do you have to be in the picture below to capture a radar image without layover and without shadow?

*To avoid shadow the local incidence angle on both sides of the mountain has to be smaller than  $90^\circ$ , i.e. if you extend both slopes of the mountain (light green lines) you have to be between these lines and again below the dark green lines to avoid layover.*



3. Why is it impossible to capture a radar image without distortions?

*To capture an image without foreshortening you have to be lower than the top of elevated objects and to avoid shadow you have to be above them and it is impossible to be both.*