where α^+ is the foreslope angle and θ is the look angle.

The greater the foreshortening, the more energy per unit area is displayed on the image until so much is avalaible that it saturates the reciever.

Besides, *layover* is an extreme case of foreshortening that occurs whenever the look angle is smaller than the fore slope angle. In this situation, the echo from the foreslope summit will be recieved first because the slant range is shorter to the top of the feature than it is to the base.. In this case a topographic feature will appear to be laid over on its side towards the near range. (Fig.1). The layover occurs mainly when steep slopes are encountered in the near range (Franceschetti et al., 1994).

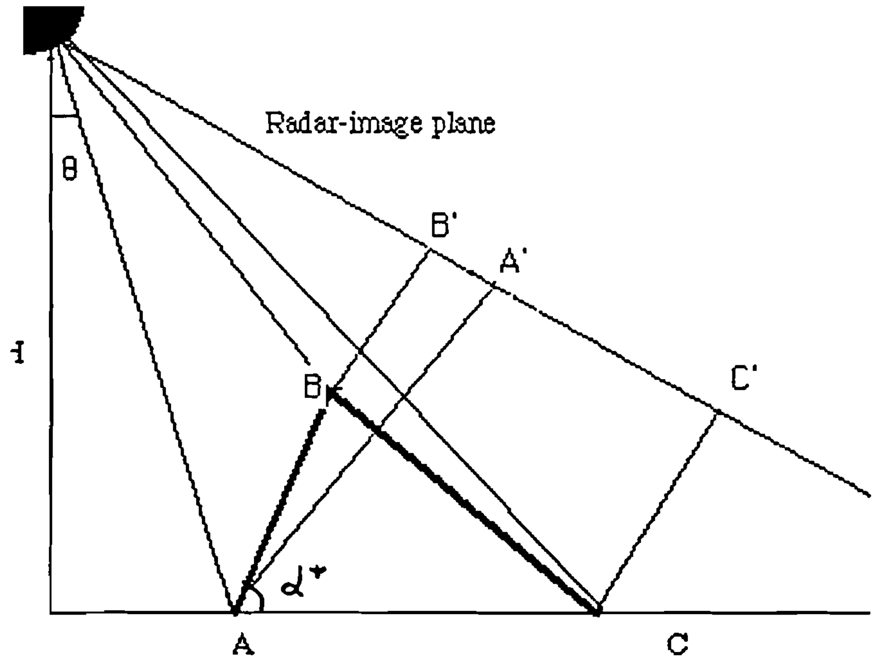

Figure 1

We suppose here that the slope AB on Figure 1 corresponds to the part of the fault plane where the slope angle is constant. The foreshortening effect will then be constant for the corresponding range A'B' on the image. The lower and the upper parts of the versant are affected by erosion so that their slope angles are smaller and their radiometry will be lower than that of the middle part AB.

ANALYSIS OF THE RADAR SCENE OF THE ATACAMA FAULT ZONE

The training zone is situated here on segments of the Atacama fault in Northern Chile. In late Miocene, the Atacama Fault Zone (AFZ) has suffered major neotectonic reactivation and deformation continues until Present (Armijo and Thiele, 1991).

The SAR ERS-1 scenes were acquired on 02 June 1992, from an orbit 785 km in altitude, using an antenna inclined 23° off nadir operating in the C-band (5.3 Ghz). The observed earth surface is 100 by 100 km and ground resolution is 12,5 m .We show on figure 2 a segment of the fault from a subscene of a Radar SAR ERS-1 image.

Most of the segments of the AFZ are oriented NW-SE (Okada, 1972) and are consequently sub orthogonal to the radar beam. Within such a context, it is obvious that radar SAR ERS-1 images significantly enhances the mapping of this fault system. Recent faults corresponds thence to white lineaments on the image.

This type of fault is characterized by changes in the scarp height along the strike which corresponds on the image to variations of the thickness of the fault line (see Fig 2). In this case, we suppose that the fault dip is constant and that only the scarp height varies. The foreshortening effect must consequently be constant along the scarp and the fault line appears as a light line, the width of which beeing proportional to the slope length and therefore to the scarp height.

It is then possible to estimate relative fault throws along the same fault line, by calculating the width of the line on the radar image.

Figure 2: ERS-1 subscene of the Atacama Fault Zone

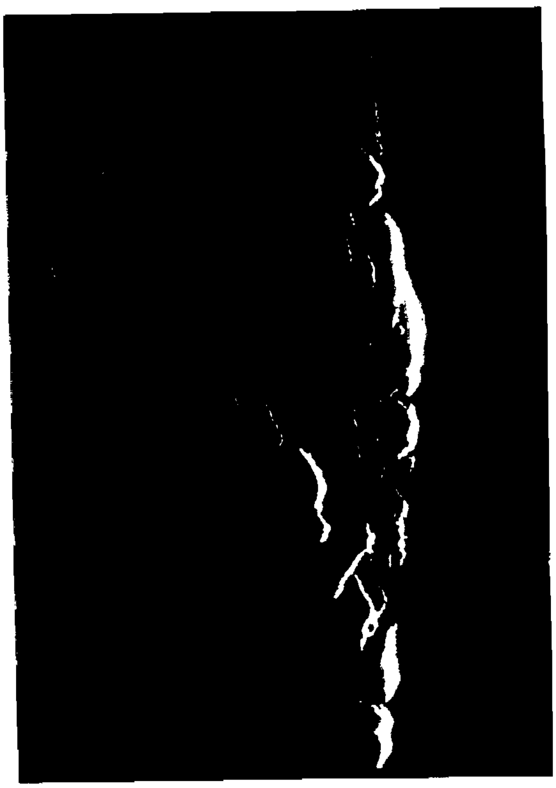

Figure 3: Extraction of fault scarps

Figure 4: Maximal Thickness image