

= Compton ? Belkovich Thorium Anomaly =

The Compton ? Belkovich Thorium Anomaly is a hotspot (volcanic complex) on the Moon . It is on the far side of the Moon and was found by a gamma @-@ ray spectrometer in 1998 . It is an area of concentrated thorium , a radioactive element . Lunar rock samples from the Apollo missions reveal that most lunar volcanism occurred around 3 to 4 billion years ago , but could have been as recent as 1 billion years ago due to the unknown history of the moon 's far side .

= = Description = =

The Compton ? Belkovich Thorium Anomaly was found in 1998 by the Gamma Ray Spectrometer (GRS) instrument on board the Lunar Prospector (LP) and subsequently identified as a hotspot , located around 61 @. @ 1 ° N 99 @. @ 5 ° E ? / 61 @. @ 1 ; 99 @. @ 5 . The estimated thorium concentration reaches 5 @. @ 3 µg / g (5 @. @ 3 micrograms per gram) while the surrounding highland basalts only contain between 0 and 2 µg / g . Compared to the Earth 's thorium concentration of 0 @. @ 06 µg / g , the Compton ? Belkovich 's is very high . It has unusually high reflectance , identified by a visible imaging study that was carried out later by the Clementine spacecraft in a Clementine Visible Images study . High resolution images from the Lunar Reconnaissance Orbiter LRO made it possible to analyze the surface features of the Compton ? Belkovich Thorium Anomaly in 2011 .

= = = Location = = =

The anomaly is between the Bel 'kovich crater , which is 214 kilometres (133 mi) wide , and the Compton crater , which is 162 kilometres (101 mi) wide . The region as a whole is 32 kilometres (20 mi) wide and 18 kilometres (11 mi) long .

The center of the region is a volcanic complex , 25 kilometres (16 mi) to 35 kilometres (22 mi) across , between the Bel 'kovich and the Compton craters . It is 900 kilometres (560 mi) from the extent of the northeastern Procellarum KREEP Terrane (an area which has high abundances of KREEP , a geochemical component of some lunar rocks) .

= = = Features = = =

In the center of the elevated region is a depression ; this is bounded by scarps and may be some kind of caldera . Just to the north is a feature called Little Dome , 500 metres (1 @, @ 600 ft) in diameter . Further north is an elongated dome , oriented north @-@ south , called Middle Dome . It is 2 @. @ 5 kilometres (1 @. @ 6 mi) long and 0 @. @ 6 kilometres (0 @. @ 37 mi) wide . Both Little Dome and Middle Dome have boulders on top that may be volcanic blocks . Big Dome is further to the north at the edge of the anomaly . It is 2 @. @ 5 kilometres (1 @. @ 6 mi) in diameter with a depression in the top .

An extension of the reflective material extends to the south @-@ east from the elevated region by about 7 kilometres (4 @. @ 3 mi) . This may be a pyroclastic flow . This more highly reflective area also matches an area that shows a Christiansen feature with shorter wavelength . It reflects more strongly in the 7 @. @ 1 to 7 @. @ 5 ?m range , which indicates quartz or alkali feldspar is the major constituent .

Explosive remains also appear scattered to the east for about 300 km covering an area of 70 @, @ 000 km² .

= = = Volcanic slope = = =

Volcanic features provide information about the composition of the lava that formed the Compton ? Belkovich Thorium Anomaly . On average , many volcanoes on the Moon have slopes of lower than 7 degrees . However , the Compton ? Belkovich Thorium Anomaly has a slope which reaches 25

degrees at the highest . This suggests that the region was formed by more viscous lava .

= = = Composition = = =

Using infrared reflectance data from Clementine at 750 nm and 950 nm , the level of iron oxide was determined to be about 3 % by mass .

= = = Formation = = =

A direct analysis of Apollo program samples revealed that most lunar volcanism occurred around 3 to 4 billion years ago . However , volcanic activity on the unsampled lunar back side could have occurred around 1 billion years ago . The smoothness of the surface associated with the anomaly indicates that it could possibly have been formed in a more recent event .

As the lava cooled , it would have crystallized to produce a silicate structure ; incompatible elements such as thorium would have been excluded from the process and formed thorium @-@ rich pockets in the remaining liquid rock . The eruption associated with the thorium anomaly could have created the elevated features to the west and the low and broad area to the east . The latest possible eruptions of lava would have made domes with steeper slopes , and also would have caused small bulges , as they would barely reach the surface .