

# Local and Regional Moon Sighting Boundary

(Adapted from a Testimony Panel presentation by Eng. Qamar Uddin; dated 7 September 2021)

## Introduction

There is a lot of confusion about the local (or regional) moon sighting boundary (*Matla*) amongst the Muslims. Some people consider that to be within their own country (eg. UK) and include neighbouring countries in the same region (eg. Morocco). Yet, some others consider the countries in the opposite Hemisphere is also included in the boundary (eg. South Africa or South America)! So, let's explore these definitions from a technical and scientific perspective to see if we can define the local sighting boundary in the light of the Quran and Sunnah (using the Day and Night Maps).

Allah says: {وَالشَّمْسِ وَضُحَاهَا} وَالْقَمَرِ إِذَا تَلَّاهَا},

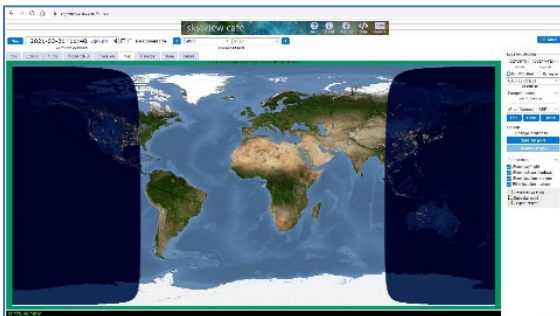
“And by the sun and its brightness; And by the moon, as it follows it (the sun)” [Quran 91:1-2]

In the commentary of the Quran (*Tafsir Ibn Kathir*), one of the eminent companions of the Prophet (ﷺ), Qatada (RA) said that this verse means, In the night of the crescent moon (*Hilal*), the moon must **follow** the sun. That is, the sun sets first and then the moon becomes visible (until the moon sets). So, this verse is telling us the sighting of the moon is between sunset to moonset. It is also well-known that sunset and moonset are related to a given location on earth and they (sunset and moonset) do not happen at the same time in all places of the earth.

Similarly, a number of authentic Ahadith mentioned that, “If the sky is cloudy for you, then complete 30-days” ([Muslim, Book 13/Hadith 6](#)). It is well-known amongst the weather/meteorology experts that cloudiness is a **local** phenomenon and the entire country or the whole world is never cloudy at the same time. Hence, the Ahadith indicate Local Moon Sighting, as was the practice of the Prophet (ﷺ) and his Rightly Guided Khulafa Rashideen (Ref: Advice of Umar (RA) to the residents of the mountains to follow their own moon sighting – see reference [1])!

## Definition of Local Boundary

We shall explain and define the boundary using the Day and Night maps based on the globe as given on various astronomy websites such as [TimeAndDate.com](#) or [SkyViewCafe.com](#) etc.



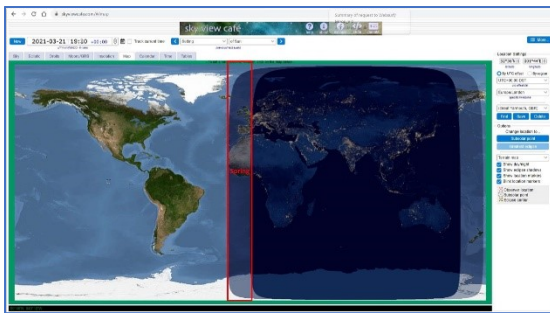
The Day and Night maps indicate the sunset and sunrise times for every location on earth at regular intervals. They are then plotted on a world map so the curves can be seen through different dates (see Fig.1). If we consider the UK boundary and take the easternmost city (eg. Great Yarmouth) for the seasons, then we find that the difference between Sunset and Moonset is about 1 - 1.5 hours (using HMNAO [Websurf](#) Moon\_Viz program).

For example, on 11 June 2021, the Moonset Lag time for Great Yarmouth (UK) is 81 mins (HMNAO/Code B), which varies slightly from month to month down to 60 mins (approx.). The difference between the sunset and the moonset for a given location is called the Moonset **Lag time**, which defines the limit of the Hilal visibility window. Note that the moon may not become visible until sometimes after the sunset due to solar glare. So, for all practical purposes, if we can share similar sunset and moonset times through all the areas of our locations (or cities) in a country, then we can say this is the **Local Sighting** boundary *because of the same possibility of sighting the moon anywhere within that area*. This definition of the Local Moon Sighting boundary (or Sharing of Night) is consistent with the Quran and Sunnah.

To define the Moon Sighting zone (*Matla*), let us consider the Day and Night Maps cover around the UK. Rather than going through all the 365 days of the year's Day and Night Maps, we shall just choose **four** key dates as follows:

1. Spring - when the Days and Nights are equal lengths (March),
2. Summer - when the earth is tilting towards the Sun ie. longer Days and shorter Nights (June) and
3. Autumn - when the Days and Nights are back to equal length (September),
4. Winter - when the earth is tilting away from the Sun ie. shorter Days and longer Nights (December)

## Hilal Visibility Window for Spring



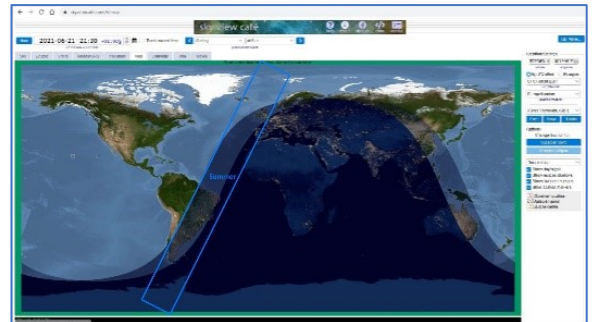
Consider the Day and Night Map for 21 March 2021 (Sunset at 18:10 GMT) in the East of the UK (Great Yarmouth). If we move West of the sunset point by 1 hour and 10 mins later, then we see that Sunset covers the whole of the UK from the East to the West.

Recall that the Moonset Lag time is about 80 mins (ie. 1 hour and 20 mins) for Great Yarmouth. So, using that Lag Time from the sunset on the Eastern point to the sunset on the Western point will be the width of the Hilal *Visibility Window* for the Spring season (see Fig.2).

## Hilal Visibility Window for Summer

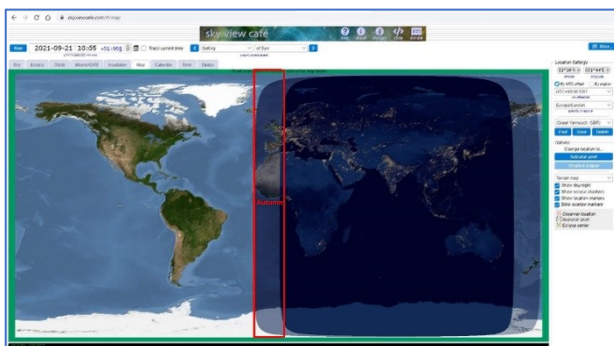
Now, let us move to 21 June 2021, which is the longest day of the year in the Northern Hemisphere (as the Earth is tilted  $23.5^\circ$  towards the sun) and it will be the shortest day of the year in the Southern Hemisphere.

Looking at the Sunset curve at the Eastern point of the UK (Sunset at 21:20 BST), which is tilting from the top-right (East) towards the bottom-left (West), shows the neighbouring Regions (i.e. Europe and West Africa) have already past their Sunset and probably past their Moonset too.



If we now move 1 hour and 10 mins or so towards the West, that would be the Moonset point. As before, the width of the curve between the sunset and the moonset points is the Hilal *Visibility Window* for the Summer season, which is at that angle like a forward-slash / (see Fig.3).

## Hilal Visibility Window for Autumn

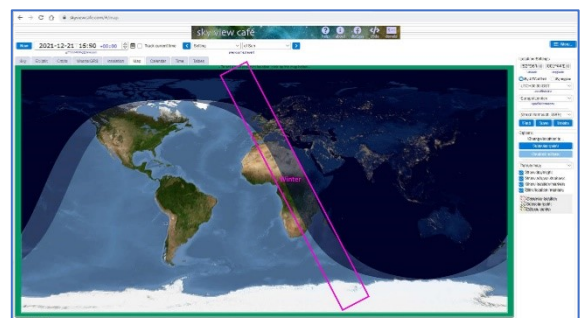


Let us now move to 21 September 2021 (Autumn), which is similar to the Spring type of days and nights, where the length of days and nights are almost equal (ie. 12 hrs each), and the Hilal *Visibility Window* is also similar to in the Spring season. The Sunset is 18:55 BST in the East of the UK (Great Yarmouth). If we move West of the sunset point by 1 hour and 10 mins later, then we see that Sunset covers the whole of the UK from the East to the West. And again, using that Lag Time from the sunset on the Eastern point to the sunset on the Western point will be the

width of the Hilal *Visibility Window* for the Autumn season (see Fig.4).

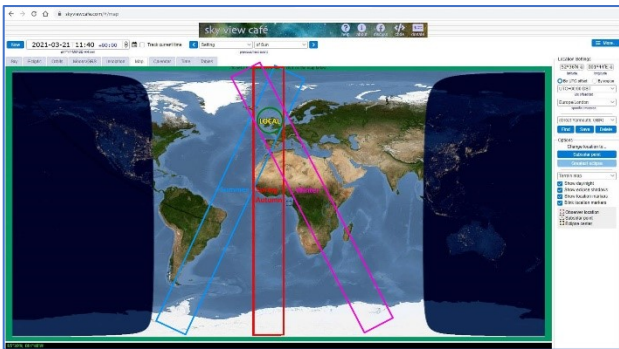
## Hilal Visibility Window for Winter

Now, let us move to 21 December 2021 (Sunset at 15:55 GMT), which is tilting from the top-left (West) towards the bottom-right (East). It is the shortest day of the year in the Northern Hemisphere (as the Earth is tilted  $23.5^\circ$  away from the sun) and it will be the longest day of the year in the Southern Hemisphere. If we now move 1 hour and 10 mins or so towards the West, that would be the Moonset point. As before, the width of the curve between the sunset and the moonset points is the Hilal *Visibility Window* for the Winter season, which is at that angle like a backward-slash \ (see Fig.5). Note that the neighbouring Regions (i.e. Europe and West Africa) are still in the day-time (early afternoon), well before their Sunsets.



Since the UK **sunset** is a few hours before the neighbouring Regions, it is possible to see the Hilal and start the month before them as was the case many years ago (eg. 2009), when the elliptical orbit of the moon was over the Northern Hemisphere, before the Southern Hemisphere (and in future during [Major Lunar Standstills](#), eg. in 2025, 2043 etc)!

### Hilal Visibility Window for all seasons



If we now replace all the previous Day and Night curves over the UK with the bandings for all four seasons (Spring, Summer, Autumn and Winter), then we will find they all form a diamond-shaped area that is shared through all seasons.

This method is similar to the Venn Diagram used in Mathematics, where we can say that the common area for all seasons of the Hilal *Visibility Window* is the area inside the diamond-shaped/triangle area. So that means, the moon would be visible within that area throughout all the seasons, but not

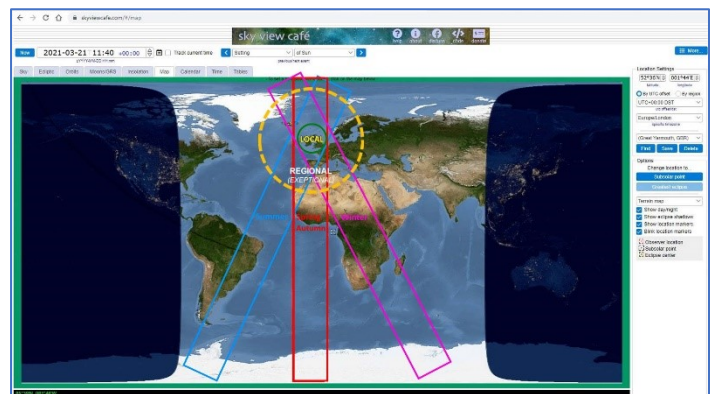
outside that area because we are not sharing the Sunset to Moonset times of that area with other places on the globe (see Fig.6).

If we were to go through all the seasons daily, the diamond-shape will form into a circle because the world is a sphere (round) and not a flat plane. Note that the area under the circle is approximate in order to explain the concept of how to define the Local Areas or Local Boundary scientifically. But we can confidently say that this is the Local Sighting boundary because the probability of anyone sighting the moon within the circle is almost equal.

### Regional Boundary (Exceptional Case)

Let us now consider the scenario if the moon was not seen for a few consecutive months due to [Major Lunar Standstills](#), as was the case in 1987, 2006 etc (or totally cloudy). In such a situation, we may have to resort to finding other solutions for such a hardship to sight the moon for Ramadan and Eid. In such cases, we have to keep completing 30-days or expand our local area to the Local Region (i.e. *Aqrab Al-Balad*) towards the Equator, as an Exceptional Case.

The question arises, what is the outer-limit of the Nearest Latitude or how far distance can we expand? We can use the area under the outer triangle as markers for the limit of expanding the Local Region because most of the time in the year (i.e. 3 out of 4 seasons or 8 out of 12 months), our Hilal *Visibility Window* will be the same in that region and for the other few months, it will be slightly before or slightly after the UK sunset times (see Fig.7). So, this is for the Exceptional Case (استثنائى حالات).



Note that this principle of the Nearest Latitude also agrees with the Fiqh ruling described in Allamah Dr Khalid Mahmood's book, "Why Two Eids?". It says in his book, "similarity of rising [visibility] time". He also said that it is not correct that "Unity of Horizon" (*Ittihad e Matale*) or Global Sighting is the Hanafi position! That is **not** true. He says that the Hanafi scholars only use that for **nearby** locations and they rejected it for far distance countries. The concept of nearby countries also agrees with our current understanding of the world with global communications, which may not have been the case in the 15th century, but certainly, it is the case in the 21st century. That is, Unity of Horizons is only valid for locations within a reasonable distance because Time Zone differences make some parts of the world as night and other parts as day, hence the whole world can never have Unity of Horizon for moon sighting purposes!

### Local Sighting Boundary of Kuraib Hadith

A question may arise, how does the above principle (using Day and Night maps) compare with historical facts? So, let us now fast backward in time to the 7th century and apply the same principle to the Kuraib Hadith as recorded in many books of Ahadith (e.g. [Sahih Muslim](#)) which highlights the Moon Sighting boundary (*Matale*). The Hadith

mentions that a traveller from Madinah (Saudi Arabia) went to visit Damascus (Syria) where the crescent moon of Ramadan was sighted on Friday and when he returned to Madinah (before the end of Ramadan) he discovered that it was sighted on Saturday. However, Ibn Abbas (RA) did not back-date the start of Ramadan to the previous day based on the moon sighting by Mu'awiya (RA) in Damascus (a far distant city) and insisted on following the Local Moon Sighting of Madinah or completing 30-days, as commanded by the Prophet (ﷺ). Note that these two places mentioned in the Hadith (ie. Madinah and Damascus) are two capital cities in two far distant countries of the world mentioned in historical texts (and not like the neighbouring cities in the modern world within short distances).



If we apply the same principle of the Hilal *Visibility Window* (using Day and Night maps) as explained above, we will find that the Local Moon Sighting of Damascus is different from that of Madinah. That is, they both have a separate area of Local Moon Sighting zones through all seasons and do not overlap with each other (see Fig.8). So, now we can use this explanation to support the Kuraib Hadith that both cities of the world had separate Sighting Zones. It was not as some people misunderstood that Damascus was in the West of Madinah and hence, they didn't follow it (or vice versa).

Now, let us fast forward from the Kuraib Hadith in the 7th century to the 14th century. That is the lifetime of Shaykh ul-Islam Ibn Taymiyyah (RA) who used to live in Damascus. He was a Hanbali scholar, but accepted by all Maslak, as a leading scholar of his time and he said in Majmua Fatawa (vol.13/p.62) that if there is a sighting in the East, then it must be sighted in the West but not the other way around (ولا ينعكس). What is not clear is that the distance between the East and West was the maximum travelling distance of their time through which the news can be conveyed. Realise that in the 14th century, news could not be conveyed from Australia to America (East to West) in one evening, especially when they are Day and Night apart. So, we can reasonably conclude that the ruling by Ibn Taymiyyah (RA) applies to the East-West of the **Local Sighting** zone, which also agrees with the Kuraib Hadith.

### Summary of Moon Sighting Boundary

The Moon Sighting Zone (*Matla*) is defined as the Hilal *Visibility Window* that is shared through all seasons (using Day and Night maps) and it is under the same legal jurisdiction. However, if there is an exceptional case due to some hardships (Haraj) when the moon *cannot* be seen for many consecutive months on the 29<sup>th</sup> lunar date, then the Moon Sighting Boundary may be expanded to the Regional Sighting Zone where the visibility must be shared for most of the seasons. The Regional Sighting Zone could be interpreted as the old equivalent of Ittihad Matla (Unity of Horizons), which was commonly interpreted as “Global Sighting” in the past, but it should be interpreted as Regional Sighting in the 21<sup>st</sup> century. The expansion of the Local Sighting to Regional Sighting boundary should be only used for the duration of any hardships and not beyond that (e.g. while developing Sighting Locations in critical areas).

The above definition of the Local Moon Sighting Boundary is fully consistent with the Quran (2:189/ 9:36/ 91:1-2), Sunnah/Kuraib Hadith (Bukhari/Muslim), Fiqh (*Ikhtilaf Al Matale*) and Islamic History, as explained by Shaykh ul-Islam Ibn Taymiyyah (RA) in the 14<sup>th</sup> century Damascus (Syria). It is also consistent with the advice of Khulafa Rashideen, such as Umar (RA) to the residents of the mountains to follow their own moon sighting, even if it differs from other regions! [1] Note also, the Prophet (ﷺ) said: {فَعَلَيْكُمْ بِسُنَّتِي وَسُنَّةِ الْخُلَفَاءِ الرَّاشِدِينَ الْمُهْدِيِّينَ}, “Follow my Sunnah and the Sunnah of the Khulafa ar-Rashideen” (AbuDawud, Book 42/Hadith 12) (Tirmidhi, Book 41/Hadith 32).

Therefore, it can be safely concluded that following **Local Moon Sighting** by the British Muslims from within the **British Isles** is fully consistent with the Quran and Sunnah. We hope and pray that the UK Muslims will support their Imams and Scholars to **unite** on Local Moon Sighting, sooner than later, InshaAllah. [Qamar Uddin / June 2022]

**Reference:** [UK Moon Sighting Fatawa 1443/April 2022 \(English/Urdu PDF, 56 pages\)](http://www.moonsighting.org.uk) [www.moonsighting.org.uk]

[1] Ghareeb al-Hadith, Imam Abu Suleiman al-Khattabi (d.388 AH), Vol. 2/P.103, Umm al-Qura University, Makkah, Saudi Arabia.