TRANSFORMATION OF RESEARCH IN ISLAMIC STUDIES

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THE DISAPPEARANCE OF SHAF AQ AL-ABYAD AT DUSK AT TANJUNG ARU, SABAH, MALAYSIA

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Abstract

The disappearance of shafaq phenomenon at dusk marks the ending time of Maghrib and the beginning time of ‘Ishā’. Fiqh explanation is the most basic approach to clarify the phenomenon while astronomical consideration which covers computational and observational method explains the phenomenon quantitatively. The study implements astronomical observation as tool to assist fiqh in explaining the phenomenon explicitly as it contains empirical justification. Based on the suitability aspect, the disappearance of shafaq al-abyad is applied for Malaysia locality condition. The observation was conducted to study the phenomenon at Tanjung Aru, Sabah, East Malaysia. According to the obtained results using SQM-LE meter, the sky brightness magnitudes for the disappearance of shafaq al-abyad as the lower limit of astronomical dusk is obtained averagely at 20.79 ± 0.36 mag/arcsec$^2$ of sky brightness with mean solar depression angle at 107.99° ± 0.16° while the values for the lower limit of civil and nautical dusk are considered to be 12.85 ± 0.73 mag/arcsec$^2$ and 19.76 ± 0.49 mag/arcsec$^2$ respectively. The results also indicate that SQM-LE meter has provides better magnitude reading than SQM-L and derives lower variability of solar depression to determine the disappearance of shafaq al-abyad.

Keywords: sky quality meter, Muslim prayer time, sky brightness

Abstrak

Fenomena kehilangan shafaq semasa senja adalah menandakan tamatnya waktu Maghrib dan bermulanya waktu Isya. Keterangan fiqh menyediakan satu pendekatan yang cukup asas untuk menghuraikan fenomena tersebut, manakala pertimbangan astronomi yang meliputi pendekatan matematik dan cerapan menjelaskan fenomena tersebut dalam bentuk yang lebih kuantitatif. Kajian ini menerapkan kaedah cerapan astronomi sebagai alat untuk membantu fiqh menentukan fenomena tersebut secara terperinci kerana perspektif astronomi memiliki justifikasi empirikal. Berdasarkan aspek kesesuaian, fenomena kehilangan shafaq al-abyad digunakan untuk keadaan tempatan Malaysia. Untuk menyelidik fenomena tersebut, cerapan telah dijalankan di Tanjung Aru, Sabah, Malaysia Timur. Berpanduan kepada keputusan yang diperolehi menggunakan alat meter SQM-LE, magnitud kecerahan langit untuk kehilangan shafaq al-abyad sebagai had terendah kecerahan senja astronomi diperolehi secara purata pada nilai 20.79 ± 0.36 mag/arcsec$^2$ dengan purata sudut
junaman matahari 107.99° ± 0.16° manakala nilai had terendah kecerahan senja awam adalah 12.85 ± 0.73 mag/arcsec² dan senja kelautan adalah 19.76 ± 0.49 mag/arcsec². Kajian ini turut mendapati bahawa meter SQM-LE menyediakan bacaan magnitud yang lebih baik berbanding SQM-L dan memberikan nilai sistih sudut junaman matahari yang lebih rendah untuk menentukan fenomena kehilangan shafaq al-abyaḍ.

1.0 INTRODUCTION

The dusk phenomenon occurs after the sun has set at the western horizon. The observer on the earth receives light at the time of sunset. It is scattered and reflected by earth’s atmosphere. The intensity of light diminishes as the sun sinks further below the horizon. The intensity spectrum ranges from 100 nm to 22.5 μm. It is category in three conditions as civil, nautical and astronomical dusk correspondingly based on sky brightness condition and solar depression angle.

Muslim certainly concerns on the phenomenon since their daily prayer times are related to it i.e. Ẓūb during dawn and ʿĪshā after the disappearance of shafaq particularly occurs at dusk. This study is performed in order to determine the sky brightness condition at dusk stages and for the disappearance of shafaq al-abyaḍ. In addition, it is also to check the appropriate method using SQM for the observation of sky brightness condition at dusk.

2.0 THEORY AND METHODOLOGY

2.1 Theory

In fiqh perspective, shafaq literally means reddening and contextually is remarked as the sky condition at western horizon related to the determination of the ending time of Maghrib and the beginning time of ʿĪshā. The sky changes slowly from reddening, followed yellowing and lastly whitening before it appears completely dark. Scholars of fiqh namely fuqahā’ agree salāt of Maghrib ends and ʿĪshā begins when the phenomenon of shafaq is set in but they have different views in explaining the sky condition of shafaq. The phenomenon is comprehended by fuqahā’ from the verses of al-Qur’ān and the text of al-Hadīth. Thus, the occurrence of dusk at western sky horizon contains the disappearance of shafaq.

There are two types of sky condition of shafaq have been defined by fuqahā’ i.e. shafaq al-almār and shafaq al-abyaḍ. The descriptions distinct in terms of sky brightness level at western horizon after sunset. Maghrib is started after sunset. It will ends following ʿĪshā begins either at the end of shafaq al-almār or at the end of shafaq al-abyaḍ. The period of ʿĪshā ends at the beginning of dawn.

According to fiqh explanation, the condition of sky reddening at dusk can be noted as shafaq al-almār and it occurs before shafaq al-abyaḍ. The disappearance of sky whitening when the sky is almost dark marked as shafaq al-abyaḍ. It is permitted either to use the disappearance of shafaq al-almār or the disappearance of shafaq al-abyaḍ for determining the ending time of Maghrib and the beginning time of ʿĪshā. The disappearance of shafaq al-abyaḍ is used widely in present condition as been used in Malaysia because it is more convenience and compatible for the country in equatorial region.