UNIVERSITI TEKNOLOGI MARA

THE INVESTIGATION OF SOLAR RADIO BURST TYPE III ACCOMPANIED BY TYPE II ASSOCIATED WITH SOLAR ACTIVITIES DUE TO MAGNETIC RECCONECTION

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Thesis submitted in fulfillment
of the requirements for the degree of
Master of Science
(Physics)

Faculty of Applied Science

October 2019

ABSTRACT

Solar Radio Bursts Type II (SRBT II) commonly occurs after the formation of Solar Radio Bursts Type III (SRBT III) in association with the solar flares and Coronal Mass Ejections (CMEs) events due to magnetic reconnection process. In the previous study, the SRBT II, SRBT Type III and their correlation with solar flares and CMEs respectively have not been discussed in details. The objective of this research is to study the correlation for SRBT II and SRBT III related to solar flares and CMEs events due to magnetic reconnection theory. The importance of these correlations are to enhance the understanding of the particles behaviour during the events over these two types of solar radio burst which are related to explosive phenomena such as solar flares and CMEs. The data for both SRBT III and SRBT II can be obtained from the e - CALLISTO website. Meanwhile, the data for solar flares and CMEs were obtained from the Solar Monitor website and Computer Aided CMEs Tracking website respectively. There are 44 data have been collected starting from 2012 until 2017. The Pearson Correlation Coefficient is a method used in obtaining the correlation of the variables of SRBT III and SRBT II, solar flares and CMEs events. The Pearson Correlation Coefficient can be used to observe the association of the two variables. From the data of 2012 until 2017, the correlation of start frequency for SRBT III and SRBT II has been calculated and the value of R = +0.7354. The correlation of start frequency between SRBT III and SRBT II has high degree positive correlation. For the durations between these two bursts on 2012 until 2017, the value of R is +0.3430 which is moderate degree positive correlation. The start frequency and the duration of the bursts are representing the mechanical energy during the events. For the correlation of peak flux for solar flares and the start frequency of the SRBT III within the data of 2012 until 2017, the value of R is +0.3364 which is has moderate degree correlation. Meanwhile, the correlation of the velocity CMEs and the start frequency of SRBT II on 2012 until 2017, both have low degree of negative correlation with the R = -0.10024. Besides, the velocity of the CMEs and the peak flux of solar flares also representing the mechanical energy of the solar phenomena. From previous study, they found that the single SRBT III are due to the single magnetic reconnection whereas for the storm and group SRBT III are due to the multiple magnetic reconnection. Most of the events from 2012 until 2017 are correspond well with the correlations as mentions. Nevertheless, some of the events do not satisfied the correlations due to other significant factors.

ACKNOWLEDGEMENT

Alhamdulillah and all praise to Allah, the Almighty, on whom ultimately we depend for sustenance and guidance. My sincere appreciation goes to my family especially my mum Fatimah Bt. Awang, my dad Husien B. Hassan and also my fiance Muhammad Amirul B. Che Wil for mentally and physically support and for the prayers.

I would like to express the deepest appreciation to my supervisor Dr Zety Sharizat Hamidi and my co-supervisor Dr Nur Nafhatun Md Shariff who have the attitude and the substance of a genius: they continually and convincingly conveyed a spirit of adventure in regards to research and excitement in regard to teaching. Without their guidance and persistent help, this thesis would not have been possible.

I would like to thank my committee members Nur Hidayah Bt. Zainol, Siti Nur Umairah Bt. Sabri, Marhana Bt. Omar Ali, Mohamad Syazwan B. Faid and Wan Zul Adli B. Wan Mokhtar for their sharing ideas and thoughts in completing this thesis and project of CALLISTO at UiTM Station. I also would like to thank the UiTM staff, En Khalid and En. Abul for allowing us to use the Advance Laboratory in completing our CALLISTO project.

Besides that, I also would like to thank to agencies that provide us the online data for Solar Radio Bursts, solar flares and Coronal Mass Ejections. This research used the e-CALLISTO (http://www.e-callisto.org/), solar monitor (https://www.solarmonitor.org/), space weather live (https://www.spaceweatherlive.com/) and LASCO CACTus website (http://sidc.oma.be/cactus/). My special thanks also dedicated to the Chanpuak website (https://www.changpuak.ch/electronics/lpda.php) that provide the online calculation for our Log Periodic Dipole antenna.

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