

# Karakterisasi gempabumi Lombok Juli-Agustus 2018 menggunakan analisis mekanisme fokus = Characterization of Lombok earthquake 2018 using focal mechanism analysis

Tanisa Karima, author

Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=20492806&lokasi=lokal>

---

## Abstrak

### **<b>ABSTRAK</b><br>**

Analisis mekanisme fokus dilakukan terhadap 5 gempa bumi besar yang terjadi di Lombok selama bulan Juli-Agustus 2018 dengan menggunakan program KIWI dengan tujuan untuk membandingkan parameter sumber 5 gempa bumi tersebut. Prinsip program KIWI adalah mengolah tiga komponen gelombang gempa bumi pada berbagai stasiun untuk dilakukan proses inversi agar mendapatkan moment tensor dengan bantuan Fungsi Green, yang kemudian digunakan untuk membuat gelombang sintetis. Parameter-parameter sumber diambil dari gelombang sintetis tersebut, dan gelombang sintetis dianggap baik apabila kecocokan dengan gelombang observasinya memiliki nilai misfit dibawah 1. Setelah dilakukan pengolahan data untuk kelima event gempa bumi tersebut, didapatkan bahwa gempa bumi pada 29 Juli 2018 ( $Mw = 6,5$ ) memiliki nilai strike sebesar  $64^\circ$ , nilai dip  $21^\circ$ , dan nilai rake  $75^\circ$  untuk bidang pertama, dan nilai strike sebesar  $260^\circ$ , nilai dip  $70^\circ$ , dan nilai rake  $96^\circ$  untuk bidang kedua. Gempa bumi tanggal 5 Agustus 2018 ( $Mw = 6,9$ ) memiliki nilai strike  $61^\circ$ , nilai dip  $28^\circ$ , dan nilai rake  $93^\circ$  untuk bidang pertama, dan nilai strike sebesar  $238^\circ$ , nilai dip  $62^\circ$ , dan nilai rake  $88^\circ$  untuk bidang kedua. Lalu, gempa bumi tanggal 9 Agustus 2018 ( $Mw = 5,9$ ) memiliki nilai strike  $62^\circ$ , nilai dip  $36^\circ$ , dan nilai rake  $81^\circ$  untuk bidang pertama, dan nilai strike sebesar  $253^\circ$ , nilai dip  $55^\circ$ , dan nilai rake  $96^\circ$  untuk bidang kedua. Kemudian, pada gempa bumi pertama di tanggal 19 Agustus 2018 ( $Mw = 6,3$ ), didapatkan nilai strike  $74^\circ$ , nilai dip  $18^\circ$ , dan nilai rake  $93^\circ$  untuk bidang pertama, dan nilai strike sebesar  $251^\circ$ , nilai dip  $73^\circ$ , dan nilai rake  $89^\circ$  untuk bidang kedua. Terakhir, pada gempa bumi kedua di tanggal 19 Agustus 2018 ( $Mw = 6,9$ ), didapatkan nilai strike  $67^\circ$ , nilai dip  $29^\circ$ , dan nilai rake  $87^\circ$  untuk bidang pertama, dan nilai strike sebesar  $250^\circ$ , nilai dip  $61^\circ$ , dan nilai rake  $92^\circ$  untuk bidang kedua. Kelima gempa bumi ini memiliki parameter sumber yang serupa, dan memiliki bola-bola fokal yang menyatakan bahwa jenis sesar pada gempa bumi-gempa bumi ini adalah reverse fault atau patahan naik dengan bentuk bola fokal yang serupa, serta waktu kejadian dan jarak yang berdekatan sehingga kemungkinan besar disebabkan oleh sistem patahan yang sama.

<hr>

### **<b>ABSTRACT</b><br>**

Focal mechanism study was carried out on 5 major earthquakes that occurred in Lombok on July-August 2018 using the KIWI program with the aim of comparing the parameters of the 5 earthquake sources. The principle of the KIWI program is to process three earthquake wave components at various stations to do an inversion process to obtain the moment tensor with the help of the Greens Function, which is then used to make synthetic waves representing the observation waves. Source parameters are taken from these synthetic waves, and synthetic waves are considered good if the match with the observation waves have a misfit value below 1. After data are processed for all the five earthquake events, it was found that the earthquake on July 29th, 2018 ( $Mw = 6,5$ ) had a strike value of  $64^\circ$ , the value dip  $21^\circ$ , and rake value  $75^\circ$  for the first plane, and strike value of  $260^\circ$ , dip value  $70^\circ$ , and rake value  $96^\circ$  for the second plane. The

earthquake on August 5th, 2018 ( $M_w = 6.9$ ) has a strike value of  $61^\circ$ , a dip value of  $28^\circ$ , and a rake value of  $93^\circ$  for the first plane, and a strike value of  $238^\circ$ , a dip value of  $62^\circ$ , and a rake value of  $88^\circ$  for the second plane. Then, the August 9th, 2018 ( $M_w = 5.9$ ) earthquake had a strike value of  $62^\circ$ , a dip value of  $36^\circ$ , and a rake value of  $81^\circ$  for the first plane, and a strike value of  $253^\circ$ , a dip value of  $55^\circ$ , and a rake value of  $96^\circ$  for the second plane. For the first earthquake on August 19th, 2018 ( $M_w = 6.3$ ), the strike value was  $74^\circ$ , the dip value was  $18^\circ$ , and the rake value was  $93^\circ$  for the first plane, and the strike value was  $251^\circ$ , the dip value was  $73^\circ$ , and the rake value was  $89^\circ$  for the second plane. Finally, for the second earthquake on August 19th, 2018 ( $M_w = 6.9$ ), the strike value was  $67^\circ$ , the dip value was  $29^\circ$ , and the rake value was  $87^\circ$  for the first plane, and the strike value was  $250^\circ$ , the dip value was  $61^\circ$ , and the rake value was  $92^\circ$  for the second plane. These five earthquakes have similar source parameters, and have focal balls which state that the type of fault in these earthquakes are reverse faults. The similar source parameters, close range of time of occurrence & hypocenter distances indicate that the earthquake events were most likely caused by the same fault.