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[Peta Tematik Indonesia: Image \(wordpress.com\)](#). Diakses pada hari Rabu, 7 Juni 2023 jam 01.21.

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Lampiran 1. Data katalog BMKG dalam bentuk (.pha)

C:\src\1\ph2dt\Data_selayar.pha - Notepad++

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?

hypoDD.reloc hypoDD.res res lokal.bt rms lokal.bt new 4 test.mod velest.cmn

Data_selayar.pha

1	#	2022	12	29	08	07	53.2	-07.19	122.46	10.0	4.6	0.0	0.0	1.100	1
2	LRTI						21.60	1.000	P						
3	LRTI						38.10	1.000	S						
4	MMRI						26.20	1.000	P						
5	MMRI						45.60	1.000	S						
6	BBSI						28.10	1.000	P						
7	BBSI						49.40	1.000	S						
8	PSJCM						31.00	1.000	P						
9	PSJCM						55.70	1.000	S						
10	PKCI						44.60	1.000	P						
11	PKCI						77.10	1.000	S						
12	BKSI						46.50	1.000	P						
13	KJCM						48.60	1.000	P						
14	KJCM						85.60	1.000	S						
15	KAPI						53.90	1.000	P						
16	KAPI						95.80	1.000	S						
17	BNSI						55.80	1.000	P						
18	BNSI						98.10	1.000	S						
19	LSCM						60.70	1.000	P						
20	LSCM						105.20	1.000	S						
21	SFSI						63.80	1.000	P						
22	RKCM						67.00	1.000	P						
23	TOCM						89.50	1.000	P						
24	LPCM						71.30	1.000	P						
25	WUPCM						86.10	1.000	P						
26	MTCH						93.60	1.000	P						
27	SRSI						74.30	1.000	P						
28	PLAI						74.10	1.000	P						
29	PLAI						130.80	1.000	S						
30	MMCI						79.90	1.000	P						
31	LOCM						89.80	1.000	P						
32	APSI						94.20	1.000	P						
33	#	2022	12	11	15	21	27.7	-07.62	122.20	10.0	3.0	0.0	0.0	0.870	2
34	MMRI						19.30	1.000	P						
35	MMRI						34.00	1.000	S						
36	LRTI						19.30	1.000	P						
37	LRTI						33.00	1.000	S						

Norr: length : 218,023 lines : 6,250 Ln : 4,534 Col : 30 Pos : 158,081 Windows (CR LF) UTF-8 INS

C:\src\1\ph2dt\Data_selayar.pha - Notepad++

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?

hypoDD.reloc hypoDD.res res lokal.bt rms lokal.bt new 4 test.mod velest.cmn

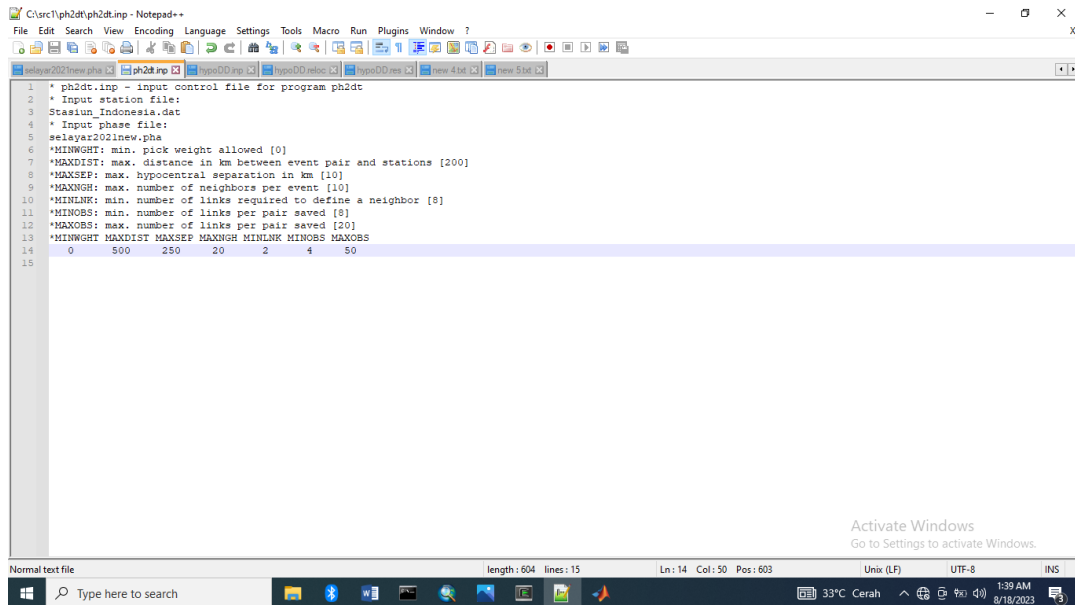
Data_selayar.pha

42	#	2022	12	04	06	27	03.4	-07.18	121.20	18.0	3.2	0.0	0.0	0.810	3
43	PSJCM						11.70	1.000	P						
44	PSJCM						20.30	1.000	S						
45	BSSI						22.60	1.000	P						
46	BSSI						39.90	1.000	S						
47	BBBCM						30.30	1.000	P						
48	MMRI						30.50	1.000	P						
49	MMRI						51.80	1.000	S						
50	KJCM						35.90	1.000	P						
51	KJCM						61.40	1.000	S						
52	BKSI						35.30	1.000	P						
53	BKSI						60.60	1.000	S						
54	BBSI						35.70	1.000	P						
55	BBSI						61.10	1.000	S						
56	BBCH						39.30	1.000	P						
57	BBCH						67.40	1.000	S						
58	#	2022	11	23	04	13	44.7	-07.57	120.45	591.0	4.9	0.0	0.0	0.720	4
59	PSJCM						69.30	1.000	P						
60	KAPI						76.70	1.000	P						
61	PLAI						78.30	1.000	P						
62	LSCM						80.40	1.000	P						
63	SFSI						81.90	1.000	P						
64	LPCM						85.20	1.000	P						
65	MMCI						89.80	1.000	P						
66	RKCM						90.70	1.000	P						
67	TOCM						92.80	1.000	P						
68	MSCM						91.60	1.000	P						
69	SRSI						91.90	1.000	P						
70	LOCM						101.50	1.000	P						
71	MPSI						117.10	1.000	P						
72	#	2022	11	20	04	22	15.0	-07.75	122.55	250.0	4.8	0.0	0.0	1.170	5
73	MMRI						35.10	1.000	P						
74	PSJCM						42.60	1.000	P						
75	PKCI						57.90	1.000	P						
76	BKSI						56.10	1.000	P						
77	KJCM						57.90	1.000	P						
78	TBCM						59.10	1.000	P						

Norr: length : 218,023 lines : 6,250 Ln : 4,534 Col : 30 Pos : 158,081 Windows (CR LF) UTF-8 INS

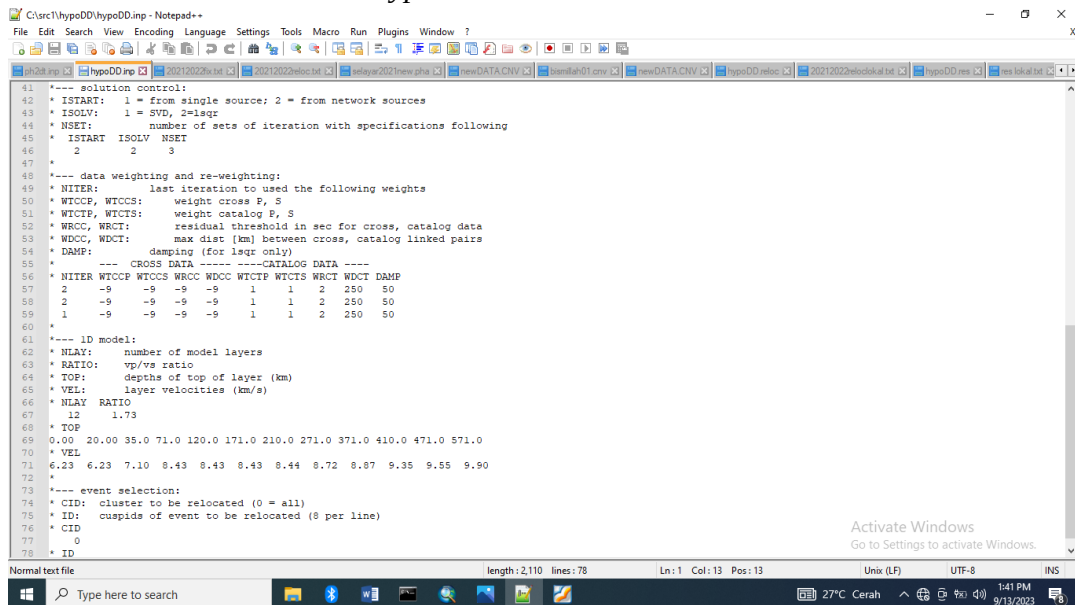
Lampiran 2. Parameter Masukan *Ph2dt* dan *HypoDD*

1. Parameter Masukan *Ph2dt*



```
1 * ph2dt.inp - input control file for program ph2dt
2 * Input station file:
3 Stasiun_Indonesia.dat
4 * Input phase file:
5 selayar2021new.pha
6 *MINWGHT: min. pick weight allowed [0]
7 *MAXDIST: max. distance in km between event pair and stations [200]
8 *MAXSEP: max. hypocentral separation in km [10]
9 *MAXNGH: max. number of neighbors per event [10]
10 *MINLNK: min. number of links required to define a neighbor [8]
11 *MINOBS: min. number of links per pair saved [8]
12 *MAXOBS: max. number of links per pair saved [20]
13 *MINWGHT MAXDIST MAXSEP MAXNGH MINLNK MINOBS MAXOBS
14 0 500 250 20 2 4 50
15
```

2. Parameter Masukan *HypoDD*



```
41 *---- solution control:
42 * ISTART: 1 = from single source; 2 = from network sources
43 * ISOLV: 1 = SVD, 2=lsqr
44 * NSET: number of sets of iteration with specifications following
45 * ISTART ISOLV NSET
46 2 2 3
47 *
48 *---- data weighting and re-weighting:
49 * NITER: last iteration to used the following weights
50 * WTCCP, WTCCS: weight cross P, S
51 * WTCP, WTCS: weight catalog P, S
52 * WRCC, WRCT: residual threshold in sec for cross, catalog data
53 * WDCC, WDCT: max dist [km] between cross, catalog linked pairs
54 * DAMP: damping (for lsqr only)
55 * --- CROSS DATA --- CATALOG DATA ---
56 * NITER WTCCP WTCCS WRCC WDCC WTCP WTCS WRCT WDCT DAMP
57 2 -9 -9 -9 -9 1 1 2 250 50
58 2 -9 -9 -9 -9 1 1 2 250 50
59 1 -9 -9 -9 -9 1 1 2 250 50
60 *
61 *---- 1D model:
62 * NLAY: number of model layers
63 * RATIO: vp/vs ratio
64 * TOP: depths of top of layer (km)
65 * VEL: layer velocities (km/s)
66 * NLAY RATIO
67 12 1.73
68 * TOP
69 0.00 20.00 35.0 71.0 120.0 171.0 210.0 271.0 371.0 410.0 471.0 571.0
70 * VEL
71 6.23 6.23 7.10 8.43 8.43 8.43 8.44 8.72 8.87 9.35 9.55 9.90
72 *
73 *---- event selection:
74 * CID: cluster to be relocated (0 = all)
75 * ID: cuspside of event to be relocated (8 per line)
76 * CID
77 0
78 * ID
```

Lampiran 3. Hasil Running *Ph2dt* dan *HypoDD*

1. Hasil Running *Ph2dt*

```
/cygdrive/c/src1/hypodd
0. 500. 250. 12 2 4 50

acer@DESKTOP-VE3D9JJ /cygdrive/c/src1/ph2dt
$ ./ph2dt ph2dt.inp
4 [main] ph2dt 480 find_fast_cwd: WARNING: Couldn't compute FAST_CWD point
er. Please report this problem to
the public mailing list cygwin@cygwin.com
starting ph2dt (v1.1 - 10/2004)...

reading data ...
> stations = 435
> events total = 434
> events selected = 434
> phases = 5815
forming dtimes...
> P-phase pairs total = 31947
> S-phase pairs total = 8641
> outliers = 1586 ( 3%)
> phases at stations not in station list = 0
> phases at distances larger than MAXDIST = 1645
> P-phase pairs selected = 27278 ( 85%)
> S-phase pairs selected = 8538 ( 98%)
> weakly linked events = 13 ( 2%)
> linked event pairs = 5033
> average links per pair = 7
> average offset (km) betw. linked events = 32.7136497
> average offset (km) betw. strongly linked events = 34.7122421
> maximum offset (km) betw. strongly linked events = 249.240891

Done.

Output files: dt.ct; event.dat; event.sel; ph2dt.log
ph2dt parameters were:
(minwght,maxdist,maxsep,maxngh,minlnk,minobs,maxobs)
0. 500. 250. 20 2 4 50
```

2. Hasil Running *HypoDD*

```
/cygdrive/c/src1/hypodd
acer@DESKTOP-VE3D9JJ /cygdrive/c/src1/hypodd
$ ./hypodd hypodd.inp
2 [main] hypodd 5064 find_fast_cwd: WARNING: Couldn't compute FAST_CWD poi
nter. Please report this problem to
the public mailing list cygwin@cygwin.com
starting hypodd (v1.1 - 10/2004)... Sun Aug 20 23:23:03 2023

INPUT FILES:
cross dtme data:
catalog dtme data: dt.ct
events: event.dat
stations: Station_Indonesia.dat
OUTPUT FILES:
initial locations: hypodd.loc
relocated events: hypodd.reloc
event pair residuals: hypodd.res
station residuals: hypodd.sta
source parameters:
Relocate all clusters
Relocate all events
Reading data ... Sun Aug 20 23:23:03 2023
# events = 434
# stations < maxdist = 64
# catalog P dtimes = 26990
# catalog S dtimes = 8526
# dtimes total = 35516
# events after dtme match = 432
# stations = 30
Clustering ...
clustered events: 432
isolated events: 0
# clusters: 1
cluster 1: 432 events

RELOCATION OF CLUSTER: 1 Sun Aug 20 23:23:08 2023
Initial trial sources = 432

IT EV CT RMSCT RMSST DX DY DZ DT OS AQ CND
% % ms % ms m m m ms m
1 100 90 561 -19.1 0 1984 1613 2661 172 0 8 76
2 1 98 84 521 -7.0 1191 1777 1399 2084 150 715 0 74
3 98 78 382 -26.7 1191 915 758 1454 81 715 8 75
4 2 96 72 355 -7.0 786 817 681 945 71 849 0 73
5 96 67 282 -20.7 786 532 429 701 46 849 1 70
6 3 96 64 261 -7.5 579 496 394 616 41 802 0 68
7 96 59 214 -17.9 579 356 263 441 28 802 5 65
8 4 95 56 197 -8.0 416 331 237 370 28 914 0 62
9 5 95 51 161 -18.2 379 247 187 313 19 913 0 59

writing out results ...
```

1. Data **.cnv** (data *arrival time* gempabumi)

1. Data **.cnv** (data *arrival time* gempabumi)

```

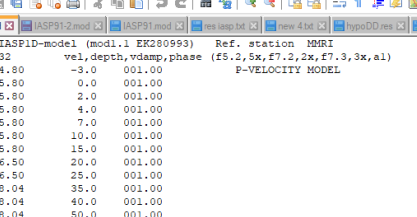
1 00000000 14.00 0.000000 121.750000 07.00 0.00
2 00000001 15.000000 29.000000 29.000000 31.000000 41.000000 46.70
3
4 220001 2146 48.50 1.490000 121.3100 10.00 2.50 0
5 00000001 16.000000 37.000000 27.000000 49.000000 27.000000 40.200000 32.00
6
7 220001 1316 55.90 1.350000 121.8100 09.00 2.90 0
8 22000001 22.000000 37.000000 29.000000 42.700000 27.000000 46.000000 31.000000 31.000000 42.000000 74.30
9
10 220001 1100 42.00 1.400000 121.4000 10.00 3.30 0
11 00000001 21.000000 35.000000 23.400000 37.000000 26.000000 45.000000 31.000000 43.000000 45.000000 49.000000 47.90
12
13 220002 1854 47.00 1.540000 121.7000 10.00 3.60 0
14 00000001 21.000000 37.000000 22.000000 39.600000 25.000000 31.000000 34.100000 42.700000 43.700000 47.100000 50.100000 52.100000 54.400000
15
16 220002 1450 39.30 1.550000 121.6000 12.00 3.20 0
17 00000001 21.000000 37.000000 22.000000 39.700000 29.000000 39.000000 47.100000 31.700000 55.000000 41.900000 75.400000 43.100000 49.10
18
19 220002 1418 35.50 1.500000 121.4900 10.00 4.70 0
20 00000001 21.000000 37.000000 22.000000 39.000000 26.000000 36.000000 43.000000 44.100000 77.000000 47.000000
21
22 220002 1642 37.00 1.850000 122.0700 25.00 3.50 0
23 00000001 35.000000 45.000000 45.000000 47.000000 83.100000 45.000000 41.000000 60.100000 61.000000 63.000000 62.000000
24
25 220001 0122 50.80 1.400000 122.3900 10.00 3.70 0
26 00000001 32.000000 39.200000 34.000000 44.000000 49.000000 51.000000 61.000000 60.100000 61.000000 63.00
27
28 220001 1320 96.50 1.400000 121.7500 23.00 3.00 0
29 00000001 36.000000 23.000000 23.000000 23.000000 39.000000 39.000000
30
31 220001 0807 48.00 1.410000 121.9400 26.00 3.50 0
32 00000001 21.000000 39.300000 22.700000 41.000000 23.000000 41.000000 55.000000 31.000000 54.100000 41.000000 75.000000 42.000000
33
34 220001 2152 58.50 1.500000 120.1700 34.00 3.50 0
35 00000001 46.000000 35.000000 35.000000 49.000000 42.000000 55.100000 57.000000 67.000000 60.000000 60.000000 73.400000
36
37 220002 0021 58.20 1.600000 122.4700 10.00 3.50 0

```

2. Data stasiun .sta

[illegible]

3. Data **.mod** (model kecepatan awal)



C:\Users\acer\Downloads\file tugas akhin\Velest\selayar\data_selayar\velest\iasp.mod - Notepad++

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?

iasp.mod x IASPID-2.mod x IASPID1.mod x res iasp.tbl x new 4.tbl x hypoDD.res x fcomet.tbl x

	IASPID-model (mod.1 EK280993)	Ref. station	MMRI
1	32	vel,depth,vdamp,phase	
2	4.80	-3.0	001.00
3	5.80	0.0	001.00
4	5.80	2.0	001.00
5	5.80	4.0	001.00
6	5.80	7.0	001.00
7	5.80	7.0	001.00
8	5.80	10.0	001.00
9	5.80	15.0	001.00
10	6.50	20.0	001.00
11	6.50	25.0	001.00
12	8.04	35.0	001.00
13	8.04	40.0	001.00
14	8.04	50.0	001.00
15	8.04	60.0	001.00
16	8.04	71.0	001.00
17	8.04	81.0	001.00
18	8.04	100.0	001.00
19	8.05	120.0	001.00
20	8.05	140.0	001.00
21	8.19	171.0	001.00
22	8.30	210.0	001.00
23	8.30	235.0	001.00
24	8.52	271.0	001.00
25	8.52	310.0	001.00
26	8.52	335.0	001.00
27	8.55	371.0	001.00
28	9.03	410.0	001.00
29	9.36	435.0	001.00
30	9.56	471.0	001.00
31	9.56	510.0	001.00
32	9.56	535.0	001.00
33	9.90	571.0	001.00
34	10.20	660.0	001.00

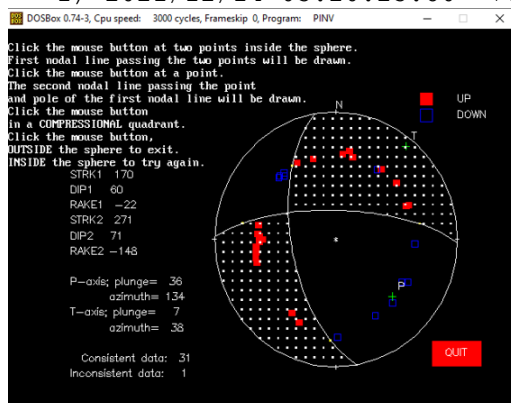
P-VELOCITY MODEL

Lampiran 5. Parameter Kontrol Program Velest 3.3

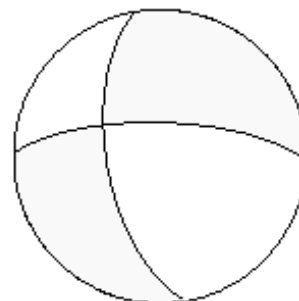
```
*C:\Users\acer\Downloads\file tugas akhir\Velest\selayar\data selayar velest\velest.cmn - Notepad++
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
velest.cmn hypoDD.loc selayarloc.txt iasp.mod iasp.mod iasp91-2.mod iasp91.mod res.iasp.txt
2 ***
3 *** ( all lines starting with * are ignored! )
4 *** ( where no filename is specified,
5 *** leave the line BLANK. Do NOT delete!)
6 ***
7 *** next line contains a title (printed on output):
8 CALAVERAS area7 1.10.93 EK startmodell vers. 1.1
9 *** starting model 1.1 based on Castillo and Ellsworth 1993, JGR
10 *** olat olon icoordsystem zshift itrial ztrial ised
11 -6.6245 -121.5107 0 0.000 0 0.00 0
12 ***
13 *** neqs nshot rotate
14 170 0 0.0
15 ***
16 *** isingle iresolcalc
17 0 0
18 ***
19 *** dmax itopo zmin veladj zadj lowveloclay
20 1000.00 0 0.00 0.20 5.00 0
21 ***
22 *** nsp swtfac vpvs nmod
23 1 0.00 0.000 1
24 ***
25 *** othet xythet zthet vthet stathet
26 0.01 0.01 0.01 1.00 0.01
27 ***
28 *** nsinv nshcor nshfix iuseelev iusestacorr
29 1 0 0 1 1
30 ***
31 *** iturbo icnvout istaout ismpout
32 1 1 1 0
33 ***
34 *** irayout idrvout ialeout idspout irflout irfrout iresout
35 0 0 0 0 0 0 0
36 ***
37 *** delmin ittmax invertratio
38 0.050 03 1
Norr length: 2,595 lines: 108 Ln: 38 Col: 29 Pos: 1,329 Unix (LF) UTF-8 INS
```

Lampiran 6. Data gempabumi terpilih dan analisis Mekanisme Fokus pada AZMTAK

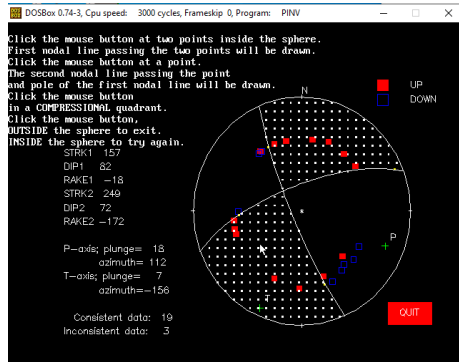
1) 2021/12/14 03:20:23.80 -7.6033 122.2274 14.3 7.4



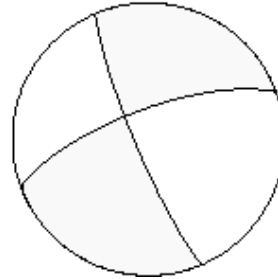
Strike 170 Dip 60 Slip -22



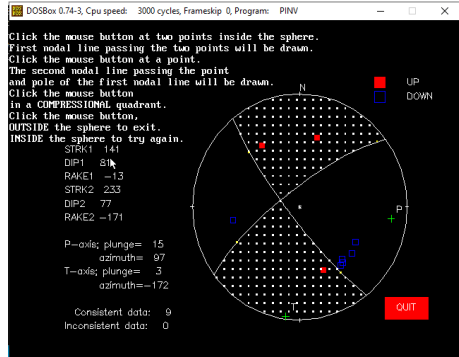
2) 2021/12/14 05:46:40.53 -7.5496 121.7358 10.0 5.0



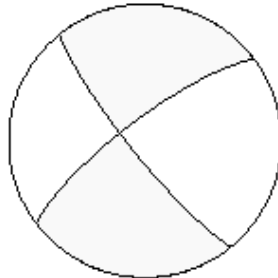
Strike 157 Dip 82 Slip -18



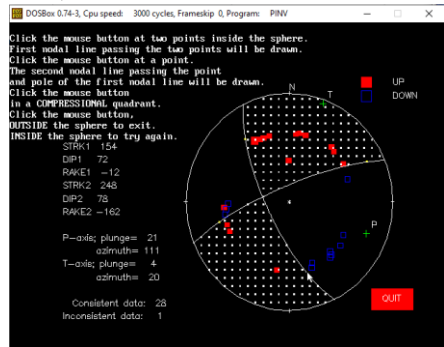
3) 2021/12/15 03:52:35.02 -7.1979 121.1629 10.0 4.5



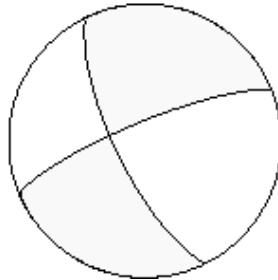
Strike 141 Dip 81 Slip -13



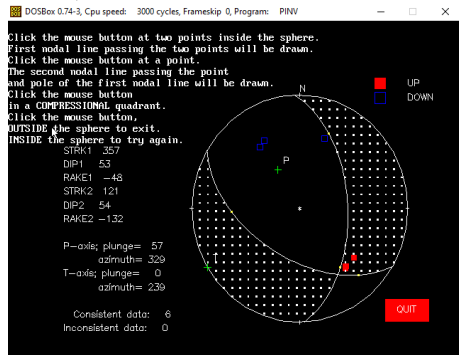
4) 2021/12/18 02:10:41.77 -7.2580 121.1570 10.0 4.6



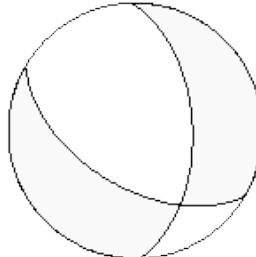
Strike 154 Dip 72 Slip -12



5) 2022/01/27 3:19:52.480 -6.694542 120.662040 13.546 3.6



Strike 121 Dip 54 Slip -132



Lampiran 7. Validasi data *focal mechanism* dari CMT

Global CMT Search Results

https://www.globalcmt.org/cgi-bin/globalcmt-cgi-bin/CMT5/form?itype=ynd&yr=2021&mo=1&day=1&otype=ynd&...

Global CMT Catalog

Search criteria:

Start date: 2021/1/1 End date: 2022/12/31
-9 <=lat<= -5 120 <=lon<= 123
0 <=depth<= 1000 -9999 <=time shift<= 9999
0 <=mb<= 10 0<=Ms<= 10 0<=Mw<= 10
0 <=tension plunge<= 90 0 <=null plunge<= 90

Results

202101081649A FLORES SEA 

Date: 2021/ 1/ 8 Centroid Time: 16:49:58.8 GMT
Lat= -7.22 Lon= 120.21
Depth=646.3 Half duration= 1.0
Centroid time minus hypocenter time: 0.7
Moment Tensor: Expo=24 -0.766 0.469 0.298 -0.111 -0.573 0.360
Mw = 5.3 mb = 0.0 Ms = 5.2 Scalar Moment = 9.51e+23
Fault plane: strike=248 dip=32 slip=-57
Fault plane: strike=30 dip=64 slip=-109

202101110120A FLORES SEA 

Date: 2021/ 1/11 Centroid Time: 1:20:39.3 GMT
Lat= -7.15 Lon= 120.35
Depth=634.1 Half duration= 1.7
Centroid time minus hypocenter time: 1.1
Moment Tensor: Expo=24 -3.070 1.700 1.370 -1.670 -2.030 1.280
Mw = 5.7 mb = 0.0 Ms = 5.6 Scalar Moment = 3.95e+24
Fault plane: strike=233 dip=24 slip=-80
Fault plane: strike=43 dip=66 slip=-94

Activate Windows