Workflows of Manual Analysis Helper (MAH)

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Outline

- Manual phase picking
- Source spectrum analysis
- CC clustering

1. Manual Phase Picking

- Input
  - fctlg: catalog file, just rough location would be enough
  - data_dir: directory of continuous waveform

- Output
  - fpha & fpha_hyp

Input	**Operation**	**Output**	***Notes***
fctlg & fsta	*ctlg2pha.py*	fpha_org	predicted phase arrival, need manual pick
fpha_org	cut events	events/[event_name] /[net.sta.chn].SAC	
	SAC *ppk* P/S/N in t0/1/2		only use *wh*!
events & fpha_org	*head2pha.py*	fpha	
fpha	cut events	events/[event_name] /[net.sta.chn].SAC	may repeat the manual picking process
fpha	event location	fpha_hyp	use Hypo-Interface-Py

2. Source Spectrum Analysis

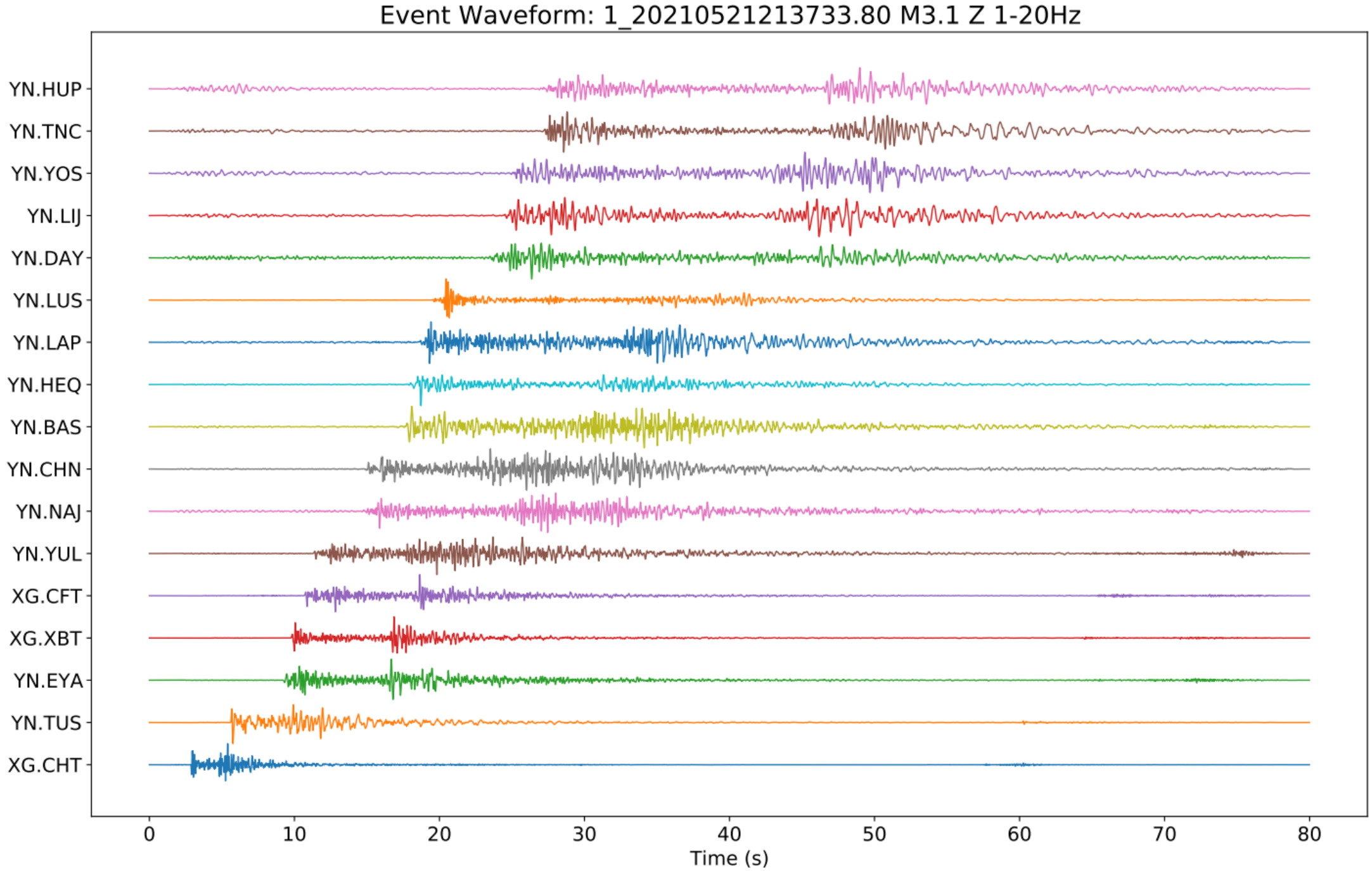
- Input
  - fctlg_all: catalog that contains all candidate EGF events
  - fsta: station file
  - data_dir: directory of continuous data
- Output

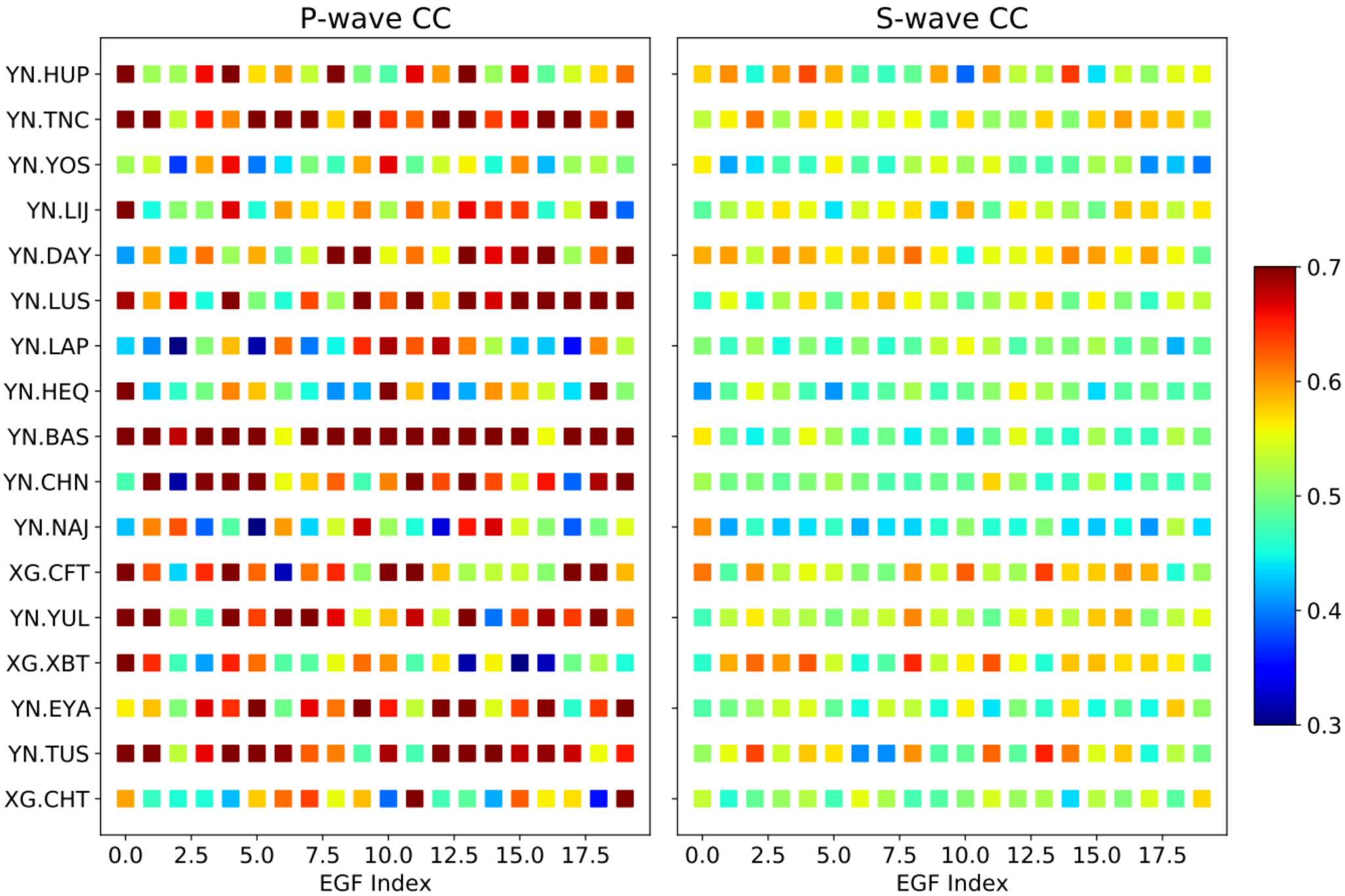
2.1 Prepare Target Event Data

Input	**Operation**	**Command**	**Output**	***Notes***
fctlg_tar & fsta	make phase file	*ctlg2pha.py*	fpha_tar_org	predicted phase arrival, need manual repick
fpha_tar_org	cut Target events	*cut_events.py*	events_tar	
	SAC *ppk*	*head2pha.py*	fpha_tar	mark P/S/N in t0/1/2, only use *wh*
fpha_tar	cut Target events	*cut_events.py*	events_tar	optional
fpha_tar	event location		fpha_tar_hyp	optional

2.1 Prepare EGF Event Data

Input	**Operation**	**Command**	**Output**	***Notes***
fctlg_all & fsta	make phase file	*ctlg2pha.py*	fpha_all_org	predicted phase arrival, need manual repick
fpha_all_org	cut events	*cut_events.py*	events_all	for CC calculation
events_tar & events_all	CC selection	*calc_tar-egf_cc.py*	fcc_tar-egf.csv	low freq_band, e.g. [0.5,5]
		select_egf.py	fpha_egf_org	should remain <20 EGF candidates
fpha_egf_org	inspect event waveform	*plot_waveform-events.py*	evid_name.pdf	check overall SNR of each candidate EGF
	inspect CC	*plot_egf-cc.py*	egf_cc.pdf	check overall CC of each candidate EGF


Event Waveform: 1_20210521213733.80 M3.1 Z 1-20Hz
YN.HUP
YN.TNC
YN.YOS
YN.LIJ
YN.DAY
YN.LUS
YN.LAP
YN.HEQ
YN.BAS
YN.CHN
YN.NAJ
YN.YUL
XG.CFT
XG.XBT
YN.EYA
YN.TUS
XG.CHT
0
10
20
30
40
50
60
70
80
Time (s)


P-wave CC
S-wave CC
YN.HUP
YN.TNC
YN.YOS
YN.LIJ
YN.DAY
YN.LUS
YN.LAP
YN.HEQ
YN.BAS
YN.CHN
YN.NAJ
XG.CFT
YN.YUL
XG.XBT
YN.EYA
YN.TUS
XG.CHT
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
EGF Index
EGF Index
0.7
0.6
0.5
0.4
0.3

2.2 Perform PLD (for the best EGF)

Input	**Operation**	**Command**	**Output**	***Notes***
events_tar & events_egf	CC alignment	*plot_cc.py*	tar/egf/ cc_sta_egf.pdf & sta/cc_pha.sac	
	manual pick CC *dtime*	*SAC ppk*		pick the first backward amin near global amax
cc_pha.sac	calc PLD misfit	*calc_pld-misfit.py*	tar/egf/ pld_sta_pha_org.pdf & sta/misfit_pha.sac & sta/astf_pha.sac	misfit & ASTF have the same length
	plot final PLD result	*plot_pld*	tar/egf/ pld_sta_pha.pdf & sta/astf_pha.sac	