

## SAMPLES FROM BINDER'S LOGFILE: PICK ASSOCIATED WITH ACTIVE HYPOCENTER

A pick will associate with an event as a given phase if its residual is less than the residual taper value (restpr) which incorporates distance and origin-quality terms (see discussion for details). In this case, a total of four phases from two hypocenters were evaluated (P,S for #40105956 and P,S for #40105957). Both P and S phases for event #40105957 qualified, but the S-phase had the lowest residual and won. The pick set was then evaluated by pick-group-assessment (the event has 10 phases, we're assessing pick-groups with between 8 and 12 picks here), all the picks were accepted, and the event was relocated. On the first iteration, the step-vector was smaller than the MinXYSstep (set to 0.1 km here), so no more iterations were performed.

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ASSOCIATION
  10  6  3 8724 MEM  NCVHZ U1  19991006101811.54      299    216    113 ← raw TYPE_PICK2K message
restpr = 2.19, r = 9.72, resmin = 1000.00
restpr = dist-taper( 1.00 ) + res1_OT( 0.16 ) + res2_OT( 1.03 ) } Association parameters for event #40105956.
#40105956 : P(66.29) S(64.29) } If residual < restpr, the pick will associate as that phase.
restpr = 2.47, r = 11.40, resmin = 1000.00 } All phases considered are shown as Phs{residual}
restpr = dist-taper( 1.00 ) + res1_OT( 0.54 ) + res2_OT( 0.93 ) } Association parameters for event #40105957.
#40105957 : P(2.17) S(0.16) }
19991006.UTC_10:18:17 bind : 40105957 MEM  NCVHZ 11.40    0.16 - Assoc. as S ← association line
bind : All picks accepted by assess_pcks } bind : eventid SNC dist residual - Assoc as Phs

EVENT LOCATION
iter : 0 Start      0.20 37.6101 -118.8310 8.27 } One line for the result of each iteration in the locator:
iter : 1 Free      0.20 37.6101 -118.8310 8.27 } iter : iteration# solution-type event-rms lat lon depth
19991006.UTC_10:18:17 hyp : 40105957 1999Oct 6 1018 6.59 37.6101 -118.8310 8.27 10 ← final location: hyp : eventid yearmonthy hrmm sec lat lon depth #picks
par : dmin = 2.2, ravg = 8.3, gap = 92.9
pck : MCM  NCVHZ P 2U 3.75 8.17 -0.26 <0.25> }
pck : MDR  NCVHZ P 2D 3.12 8.38 0.00 <0.25> } One line for each pick associated with the event:
pck : MLC  NCVHZ P 2U 7.42 8.43 -0.39 <0.25> } pck : SNC phs quality fm dist arr-secs residual <location-weight>
pck : MCV  NCVHZ P 2 2.24 8.90 0.57 <0.25> } where SNC = site network component codes, phs = phase assigned by
pck : MGP  NCVHZ P 1U 6.55 9.10 0.39 <0.50> } binder (P,Pg,Pn,S,Sg,Sn), fm= first motion, arr-secs = seconds portion
pck : HTC  NNVHZ P 2 10.37 9.22 0.00 <0.25> } of arrival time.
pck : ORC  NNVHZ P 2 15.65 10.03 0.00 <0.25> }
pck : MMP  NCVHZ P 1U 17.40 10.31 0.00 <0.50> }
pck : MLH  NCVHZ S 2D 7.73 10.58 0.09 <0.00> }
pck : MEM  NCVHZ S 1U 11.41 11.54 0.16 <0.00> }
rms : 0.20, dmin = 2.24 ← Event's final rms residual and distance to its closest station.

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## SAMPLES FROM BINDER'S LOGFILE: FAILED ASSOCIATION & FAILED STACK

Sample of a pick that attempted to associate with an event, but failed because none of the phases considered had a residual smaller than the residual taper value. Since the association failed, a stack was attempted. But the stack failed to generate a new event (event threshold = 18). The pick remains unassociated and may be used in future stacks.

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ASSOC
  10  6  3 4082 CMN  NCVHZ U2  19991004011915.49      169    149    112 ← raw TYPE_PICK2K message
restpr = 2.70, r = 85.87, resmin = 1000.00
restpr = dist-taper( 1.36 ) + res1_OT( 0.26 ) + res2_OT( 1.08 ) } Association parameters for event #51090926.
#51090926 : P(-8.04) S(-18.62) }
19991004.UTC_01:19:21 grid_stack, mhit = 4 ← stack attempt

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