SnT 2025
8 SEPTEMBER ONLINE DAY
9 TO 12 SEPTEMBER AT HOFBURG PALACE, VIENNA & ONLINE
CTBT: SCIENCE AND TECHNOLOGY CONFERENCE

LIGHTNING TALK

Moment Tensor Inversion Analysis of DPRK6 Nuclear Event Using CTBTO/IMS Data
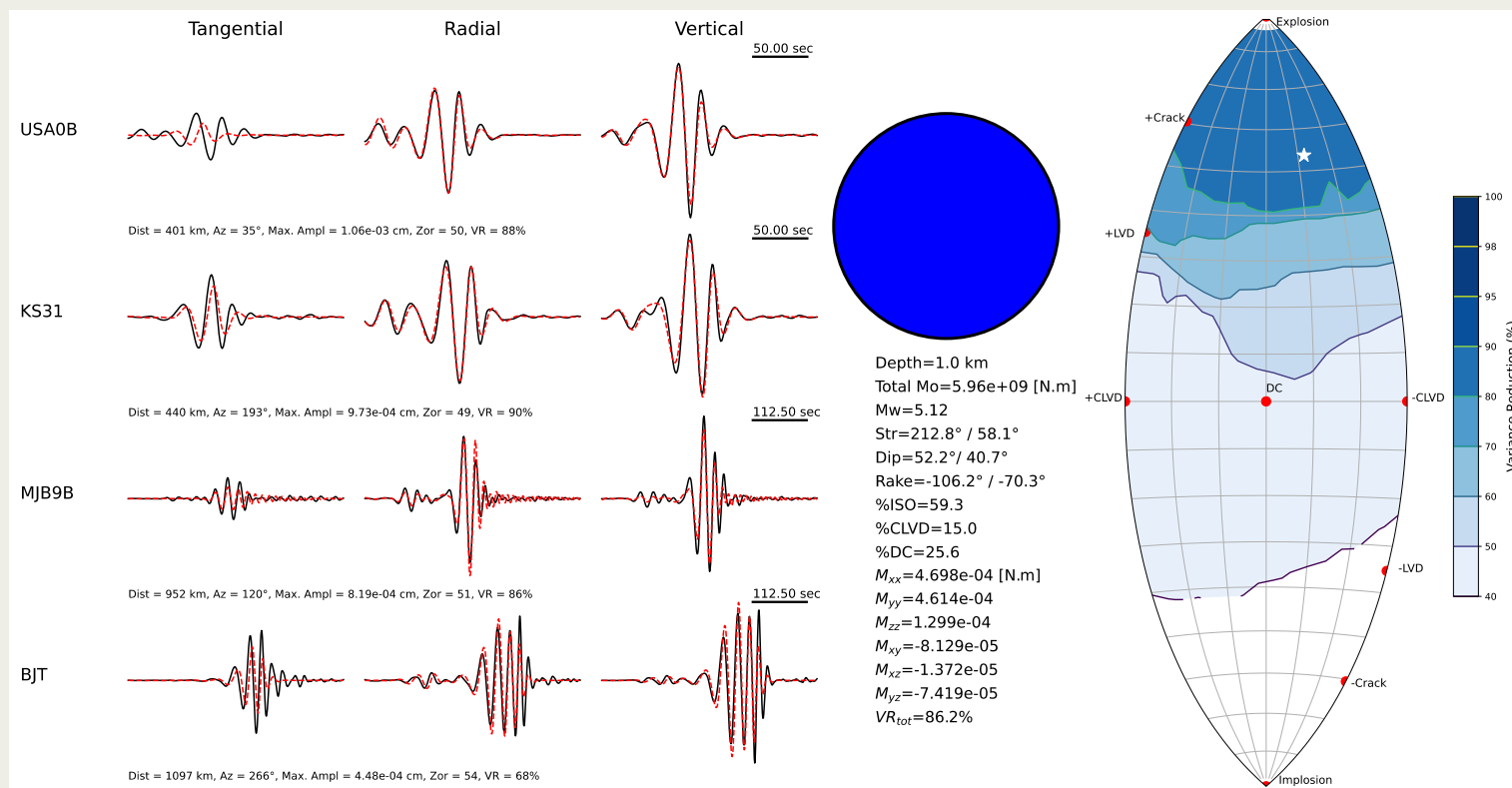
Rodrigo Chi-Durán

- **Main motivation:**

  The CTBT verification regime uses global seismic monitoring to detect underground nuclear explosions. This study examines how Moment Tensor inversion may support Expert Technical Analysis by using IMS and other data to better understand events providing key details like depth, magnitude, and source mechanism.

- **For the 6th declared nuclear test by the Democratic People's Republic of Korea, the CTBTO/IMS network demonstrated its ability to reliably characterize the source mechanism.**

- It also enables further characterization of other detected events, provided high-quality data is available!

Tangential   Radial   Vertical

USA0B — 50.00 sec
Dist = 401 km, Az = 35°, Max. Ampl = 1.06e-03 cm, Zor = 50, VR = 88%

KS31 — 50.00 sec
Dist = 440 km, Az = 193°, Max. Ampl = 9.73e-04 cm, Zor = 49, VR = 90%

MJB9B — 112.50 sec
Dist = 952 km, Az = 120°, Max. Ampl = 8.19e-04 cm, Zor = 51, VR = 86%

BJT — 112.50 sec
Dist = 1097 km, Az = 266°, Max. Ampl = 4.48e-04 cm, Zor = 54, VR = 68%

Depth=1.0 km
Total Mo=5.96e+09 [N.m]
Mw=5.12
Str=212.8° / 58.1°
Dip=52.2° / 40.7°
Rake=-106.2° / -70.3°
%ISO=59.3
%CLVD=15.0
%DC=25.6
M_{xx}=4.698e-04 [N.m]
M_{yy}=4.614e-04
M_{zz}=1.299e-04
M_{xy}=-8.129e-05
M_{xz}=-1.372e-05
M_{yz}=-7.419e-05
VR_{tot}=86.2%

Explosion
+Crack
+LVD
+CLVD   DC   -CLVD
-LVD
-Crack
Implosion

Variance Reduction (%): 100, 98, 95, 90, 80, 70, 60, 50, 40

CTBTO PREPARATORY COMMISSION | PUTTING AN END TO NUCLEAR EXPLOSIONS