

Project Description

USAcross Seismic Experiment

Evaluation of an ACROSS-type Source at the San Andreas Fault

PIC Experiment #0841 flex-array

Description:

The USAcross project is aimed at evaluating the feasibility of using an ACROSS-type seismic source to study the San Andreas Fault. The ACROSS-type source is an eccentric-mass source, such as previously used for seismic studies within the ACROSS project in Japan. It permits the generation of seismic signals over relatively long, continuous time spans. This opens up the possibility to use such a source for continuous seismic monitoring of changes along an active fault.

Within the USAcross project an ACROSS-type source was installed at two locations near the San Andreas Fault, close to the SAFOD drill site near Parkfield, CA. Small arrays of seismic stations were laid out near the two source sites, while three larger arrays were installed at three different locations within about 7 km from the source sites. The geometry of the arrays was chosen to duplicate the geometry of a former experiment by Yong-Gong Li, who had imaged the San Andreas Fault using explosions. The goal of USAcross is to reproduce the results from that former experiment using data gathered using the ACROSS-type source.

All of the USAcross related field work took place in Fall 2008. The experiment was subdivided into two phases: during the first phase, the source was installed at the LA "Lake" site; for the second phase the source was moved to the MM "Middle Mountain" site. Along with the source, some of the seismometers were first installed in the LA source array; and later moved to the MM source array. The rest of the seismometers, located in the VA, VC, and RM arrays, remained installed at the same locations throughout the experiment.

All seismic stations were equipped with Sercel/Mark Products L22

sensors, hooked up to Reftek RT130 data loggers. The RT130s were set up to record the three sensor components in a single continuous data stream sampling at 250 Hz. No telemetry or solar power was used; instead the stations were regularly serviced to read out data and swap batteries.

In addition to the seismic stations, accelerometers were used directly at the source. Also, during part of the experiment, one RT130 was recording data from a Wilcoxon borehole accelerometer installed in the SAFOD pilot hole.

Instrumentation

l22

Sensor: Sercel/l22

Components:

1	code: Z	azim: 0	dip: 180
2	code: N	azim: 0	dip: 0
3	code: E	azim: 90	dip: 0

unknown

Sensor: Sercel/l22

Components:

1	code: Z	azim: 0	dip: 180
2	code: N	azim: 0	dip: 0
3	code: E	azim: 90	dip: 0

rt130

Logger: Reftek/RT130

Input channels:

1	conn: 1	lead: 1	gain: 32	code: P
2	conn: 1	lead: 2	gain: 32	code: P
3	conn: 1	lead: 3	gain: 32	code: P

Streams:

250sps code: D 1 2 3

Lake

LA11

lat: 35.96652° lon: -120.47513° alt: 0.640 km

LA11.pdf

start: 2008-10-05T00:00:00

stop: 2008-12-31T23:59:59

RT130 S/N: 966F

L22 S/N: 455

LA12

lat: 35.96596° lon: -120.47477° alt: 0.637 km

LA12.pdf

start: 2008-10-05T00:00:00

stop: 2008-12-31T23:59:59

RT130 S/N: 9D9C

L22 S/N: 493

LA13

lat: 35.96593° lon: -120.47537° alt: 0.637 km

LA13.pdf

start: 2008-10-05T00:00:00

stop: 2008-12-31T23:59:59

RT130 S/N: 9658

L22 S/N: 449

LA21

lat: 35.96631° lon: -120.47510° alt: 0.643 km

LA21.pdf

start: 2008-10-05T00:00:00

stop: 2008-12-31T23:59:59

RT130 S/N: 938C

L22 S/N: 452

LA22

lat: 35.96603° lon: -120.47488° alt: 0.638 km
LA22.pdf
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59
RT130 S/N: 9FB8
L22 S/N: 1505

LA23

lat: 35.96604° lon: -120.47519° alt: 0.637 km
LA23.pdf
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59
RT130 S/N: 9415
L22 S/N: 728

Middle Mountain

MM11

lat: 35.95758° lon: -120.50189° alt: 0.779 km
start: 2008-10-12T00:00:00
stop: 2008-12-31T23:59:59
RT130 S/N: 9658
L22 S/N: 455

MM12

lat: 35.95755° lon: -120.50185° alt: 0.780 km
start: 2008-10-12T00:00:00
stop: 2008-12-31T23:59:59
RT130 S/N: 9D9C
L22 S/N: 728

MM13

lat: 35.95747° lon: -120.50198° alt: 0.777 km
start: 2008-10-12T00:00:00
stop: 2008-12-31T23:59:59
RT130 S/N: 9415
L22 S/N: 1505

MM21

lat: 35.95772° lon: -120.50182° alt: 0.776 km
start: 2008-10-12T00:00:00
stop: 2008-12-31T23:59:59
RT130 S/N: 9FB8
L22 S/N: 452

MM22

lat: 35.95744° lon: -120.50173° alt: 0.779 km
start: 2008-10-12T00:00:00
stop: 2008-12-31T23:59:59
RT130 S/N: 966F
L22 S/N: 449

MM23

lat: 35.95739° lon: -120.50199° alt: 0.771 km
start: 2008-10-12 00:00:00
stop: 2008-12-31T23:59:59
RT130 S/N: 938C
L22 S/N: 493

RM00

lat: 35.99411° lon: -120.48098° alt: 0.930 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59
RT130 S/N: 9DF6
L22 S/N: 232

RM11

lat: 35.99473° lon: -120.48163° alt: 0.942 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59
RT130 S/N: 9701
L22 S/N: 1487

RM12

lat: 35.99494° lon: -120.48011° alt: 0.946 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59
RT130 S/N: 9676
L22 S/N: 467

RM13

lat: 35.99405° lon: -120.47944° alt: 0.930 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59
RT130 S/N: 940F
L22 S/N: 475

RM15

lat: 35.99323° lon: -120.48199° alt: 0.901 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59
RT130 S/N: 938A
L22 S/N: 1488

RM16

lat: 35.99397° lon: -120.48241° alt: 0.921 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59
RT130 S/N: A0D2
L22 S/N: 748

RM21

lat: 35.99569° lon: -120.48235° alt: 0.957 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59
RT130 S/N: 9661
L22 S/N: 243

RM22

lat: 35.99588° lon: -120.47909° alt: 0.965 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59
RT130 S/N: 9E50
L22 S/N: 469

RM23

lat: 35.99407° lon: -120.47810° alt: 0.944 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59
RT130 S/N: 9DF1
L22 S/N: 497

RM25

lat: 35.99228° lon: -120.48272° alt: 0.888 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59
RT130 S/N: 9699
L22 S/N: 512

RM26

lat: 35.99393° lon: -120.48365° alt: 0.907 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59
RT130 S/N: 9FBC
L22 S/N: 723

VA

VA00

lat: 35.92402° lon: -120.44476° alt: 0.489 km

start: 2008-10-05T00:00:00

stop: 2008-12-31T23:59:59

RT130 S/N: 9407**L22** S/N: 491**VA11**

lat: 35.92495° lon: -120.44590° alt: 0.510 km

start: 2008-10-05T00:00:00

stop: 2008-12-31T23:59:59

RT130 S/N: 9668**L22** S/N: 1489**VA12**

lat: 35.92531° lon: -120.44430° alt: 0.494 km

start: 2008-10-05T00:00:00

stop: 2008-12-31T23:59:59

RT130 S/N: 9669**L22** S/N: 234**VA13**

lat: 35.92437° lon: -120.44313° alt: 0.489 km

start: 2008-10-05T00:00:00

stop: 2008-12-31T23:59:59

RT130 S/N: A041**L22** S/N: 507**VA14**

lat: 35.92306° lon: -120.44353° alt: 0.489 km

start: 2008-10-05T00:00:00

stop: 2008-12-31T23:59:59

RT130 S/N: 9307**L22** S/N: 486

VA15

lat: 35.92274° lon: -120.44518° alt: 0.490 km

start: 2008-10-05T00:00:00

stop: 2008-12-31T23:59:59

RT130 S/N: 9DFD**L22** S/N: 226**VA16**

lat: 35.92366° lon: -120.44635° alt: 0.490 km

start: 2008-10-05T00:00:00

stop: 2008-12-31T23:59:59

RT130 S/N: 940D**L22** S/N: 720**VA21**

lat: 35.92593° lon: -120.44731° alt: 0.508 km

start: 2008-10-05T00:00:00

stop: 2008-12-31T23:59:59

RT130 S/N: A209**L22** S/N: 464**VA22**

lat: 35.92660° lon: -120.44386° alt: 0.499 km

start: 2008-10-05T00:00:00

stop: 2008-12-31T23:59:59

RT130 S/N: A196**L22** S/N: 502**VA23**

lat: 35.92471° lon: -120.44153° alt: 0.493 km

start: 2008-10-05T00:00:00

stop: 2008-12-31T23:59:59

RT130 S/N: A198**L22** S/N: 230

VA24

lat: 35.92210° lon: -120.44242° alt: 0.492 km

start: 2008-10-05T00:00:00

stop: 2008-12-31T23:59:59

RT130 S/N: 9D5B**L22** S/N: 472**VA25**

lat: 35.92144° lon: -120.44560° alt: 0.491 km

start: 2008-10-05T00:00:00

stop: 2008-12-31T23:59:59

RT130 S/N: 98EF**L22** S/N: 641**VA26**

lat: 35.92332° lon: -120.44794° alt: 0.495 km

start: 2008-10-05T00:00:00

stop: 2008-12-31T23:59:59

RT130 S/N: 9674**L22** S/N: 485

VC**VC00**

lat: 35.92128° lon: -120.53437° alt: 0.791 km

start: 2008-10-05T00:00:00

stop: 2008-12-31T23:59:59

RT130 S/N: 9313**L22** S/N: 975**VC13**

lat: 35.92162° lon: -120.53411° alt: 0.791 km

start: 2008-10-05T00:00:00

stop: 2008-12-31T23:59:59

RT130 S/N: 9E37
L22 S/N: 957

VC14

lat: 35.92126° lon: -120.53412° alt: 0.796 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59

RT130 S/N: A0CC
L22 S/N: 977

VC15

lat: 35.92153° lon: -120.53381° alt: 0.788 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59

RT130 S/N: 9413
L22 S/N: 241

VC17

lat: 35.92149° lon: -120.53436° alt: 0.796 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59

RT130 S/N: A199
L22 S/N: 445

VC18

lat: 35.92134° lon: -120.53463° alt: 0.784 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59

RT130 S/N: 930F
L22 S/N: 237

VC21

lat: 35.92161° lon: -120.53460° alt: 0.793 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59

RT130 S/N: 969C
L22 S/N: 977

VC22

lat: 35.92179° lon: -120.53427° alt: 0.790 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59

RT130 S/N: 9DA6
L22 S/N: 490

VC23

lat: 35.92130° lon: -120.53380° alt: 0.791 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59

RT130 S/N: 9703
L22 S/N: 470

VC24

lat: 35.92102° lon: -120.53403° alt: 0.793 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59

RT130 S/N: 939E
L22 S/N: 781

VC25

lat: 35.92103° lon: -120.53436° alt: 0.784 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59

RT130 S/N: 966D
L22 S/N: 736

VC26

lat: 35.92124° lon: -120.53455° alt: 0.783 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59

RT130 S/N: A0B1
L22 S/N: 451

VC32

lat: 35.92084° lon: -120.53424° alt: 0.778 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59
RT130 S/N: 9306
L22 S/N: 1507

VC41

lat: 35.92179° lon: -120.53476° alt: 0.790 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59
RT130 S/N: A0DA
L22 S/N: 235

SAFOD

SAFOD

lat: 35.97420° lon: -120.55214° alt: 0.667 km
start: 2008-10-05T00:00:00
stop: 2008-12-31T23:59:59
RT130 S/N: 9E4A
UNKNOWN S/N: 0

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