

UMR 8538
Laboratoire de Géologie
Ecole Normale Supérieure



Director : Raúl Madariaga

Deputy director : Bruno Goffé

- **Earth Dynamics team** (Hélène Lyon-Caen)
Tectonics, Géology, Marine Géophysics, Seismology and Mantle dynamics
11 researchers
- **Earth Materials team** (Bruno Goffet)
Mineralogy, Metamorphism, Earth's materials, rock mechanics and paleomagnetism.
12 researchers

The ENS SPICE GIRLS and BOYS

Faculty members:

Hélène Lyon Caen, D.R. CNRS

Jérôme Vergne, M4C ENS

Raúl Madariaga, Prof. ENS

Secretary:

Françoise Larincq.

Visiting scientists:

Dr. Elisa Buforn, Universidad Complutense Madrid

Dr. Stefan Nielsen, INGV and Università di Napoli

Current PhD students:

Francesco Pacchiani, Anthony Sladen at ENS

Maude Cavalca and Hervé Bergne at IFP

Marco Frisenda (I) and Karin Sesetyan (Tr) Cotutelle students

Computer manager:

Pierpaolo Dubernet

Cluster animal:

16 Node Xeon Beowulf and growing

Current Projects

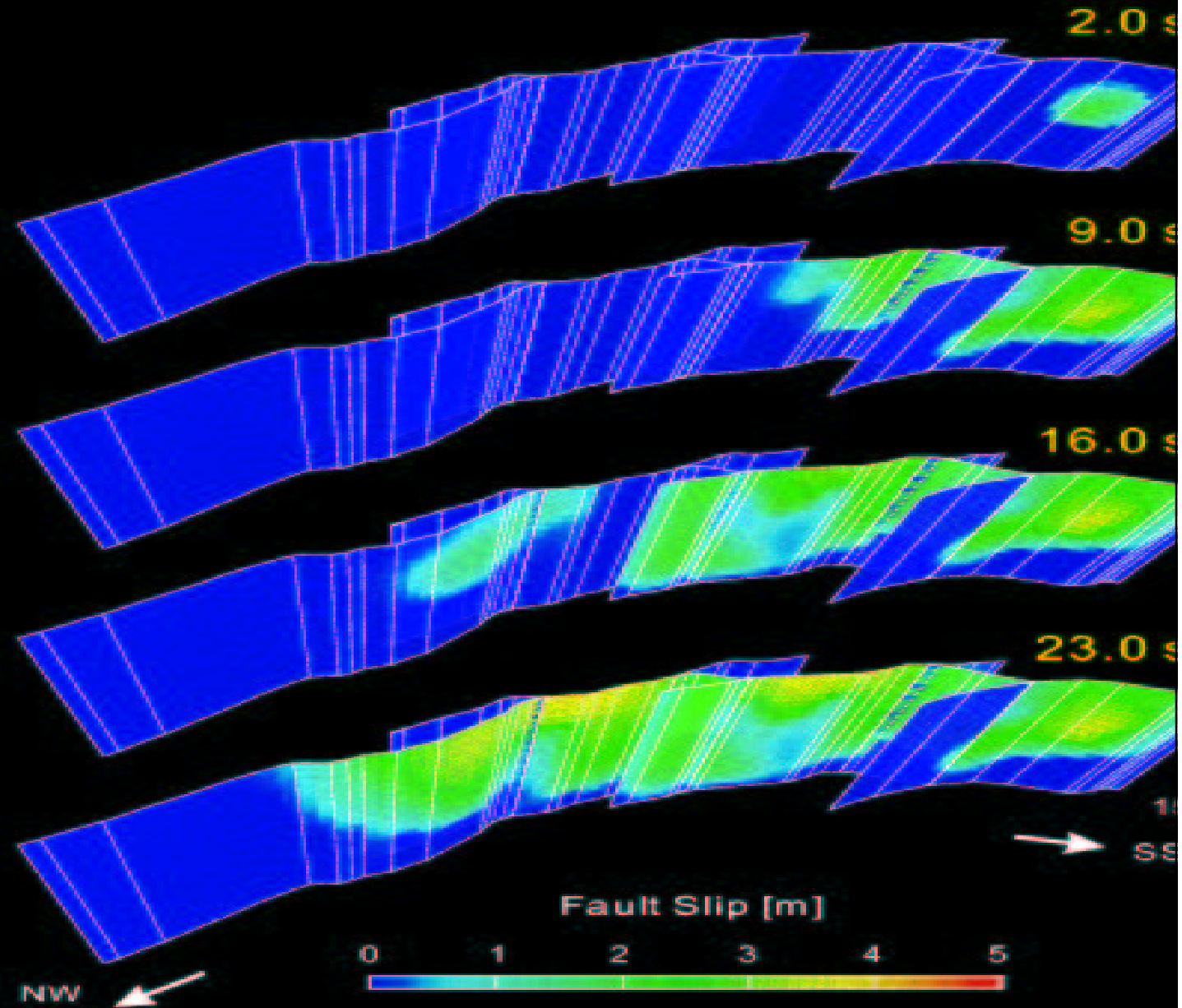
Tectonics → earthquakes → fracture and friction

1. Earthquake dynamics: modelling and inversion. Friction and seismic rupture
2. Seismicity and Geodesy of Pacific subduction zones. Current projects in Chile and Guatemala
3. Seismology in the gulf of Corinth european project
4. Earthquake interaction in Central Chile, Coulomb stresses and crack stress fields .

Seismic wave propagation → inversion → earth's structure

1. Modeling near fields wave propagation and strong motion in the gulf of Genoa and the Marmara sea.
2. Inversion of multiple reflexions in seismic profiles
3. Inverting anisotropy from OBC profiles
4. Inversion of receiver function profiles
5. Seismic tomography under Tibet

Dynamic rupture of the Landers earthquake of June 28, 1992



Aochi et al 2003

following

Peyrat et al 2001

Dynamic inversion of Tottori earthquake

Results of full nonlinear inversion by a neighborhood algorithm

32 variables

Peyrat and Olsen (2003-04)

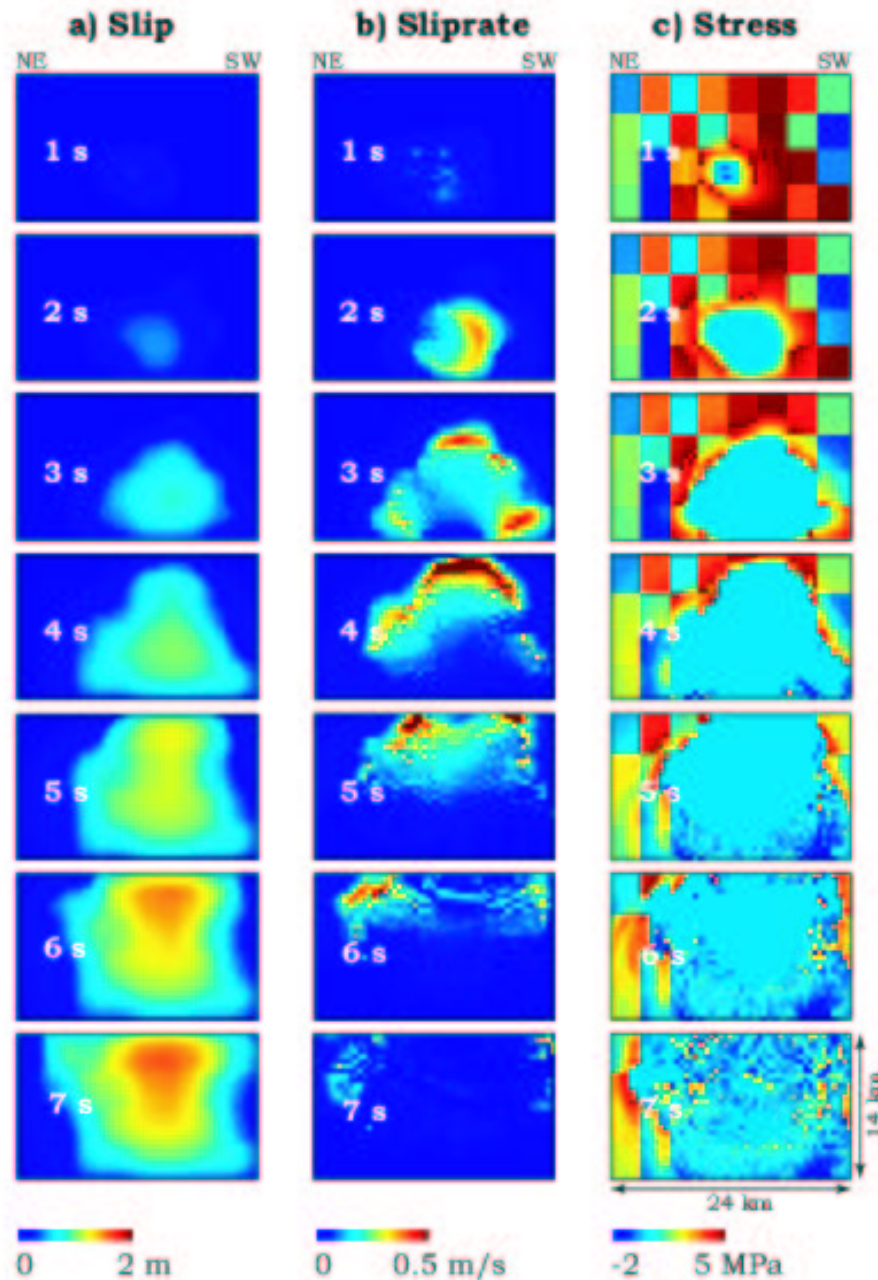
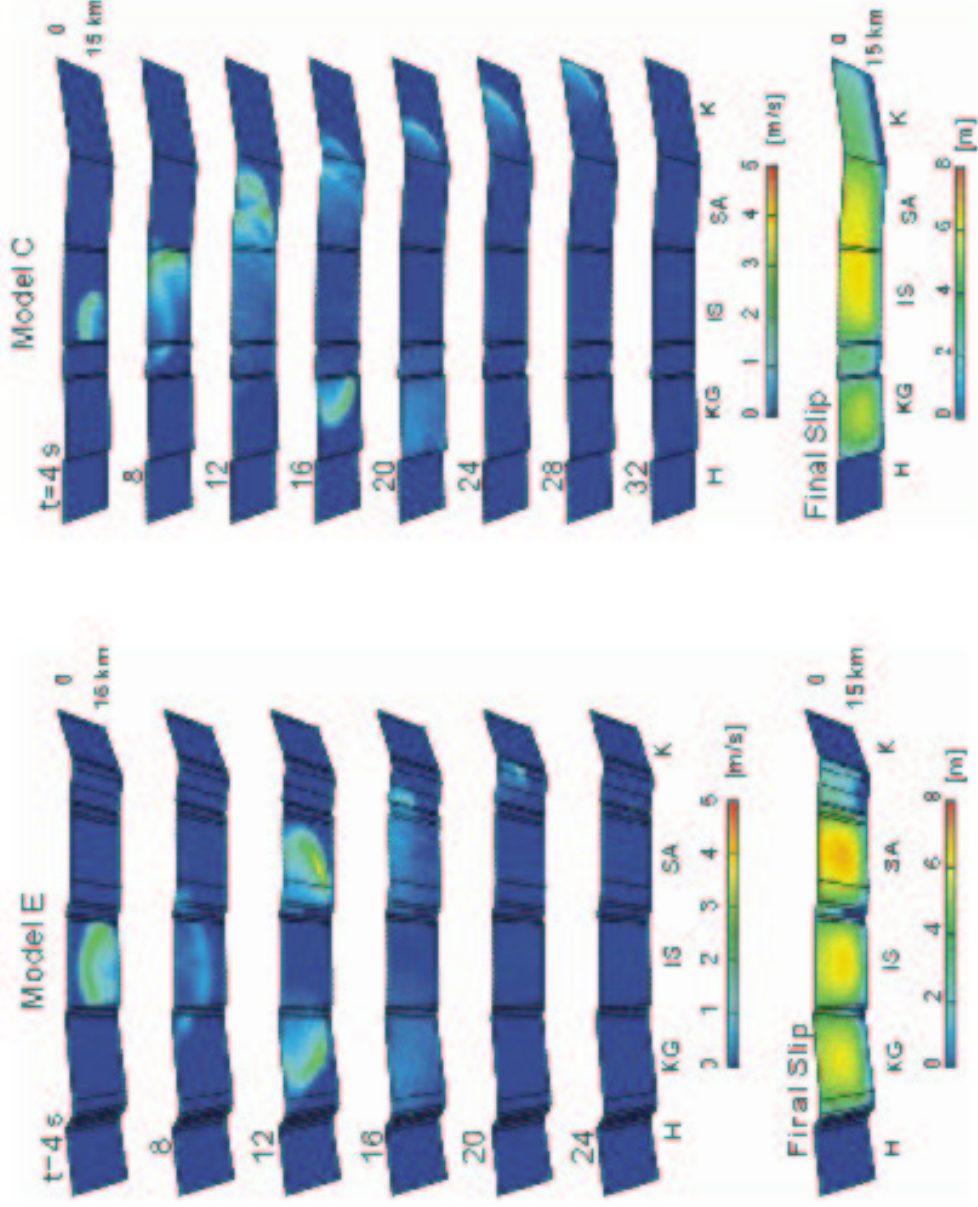


Figure 2:

Two reasonable dynamic models of the Izmit earthquake



Aochi and Madaniaga (2003)

Wave propagation around Izmit

(2) Model B

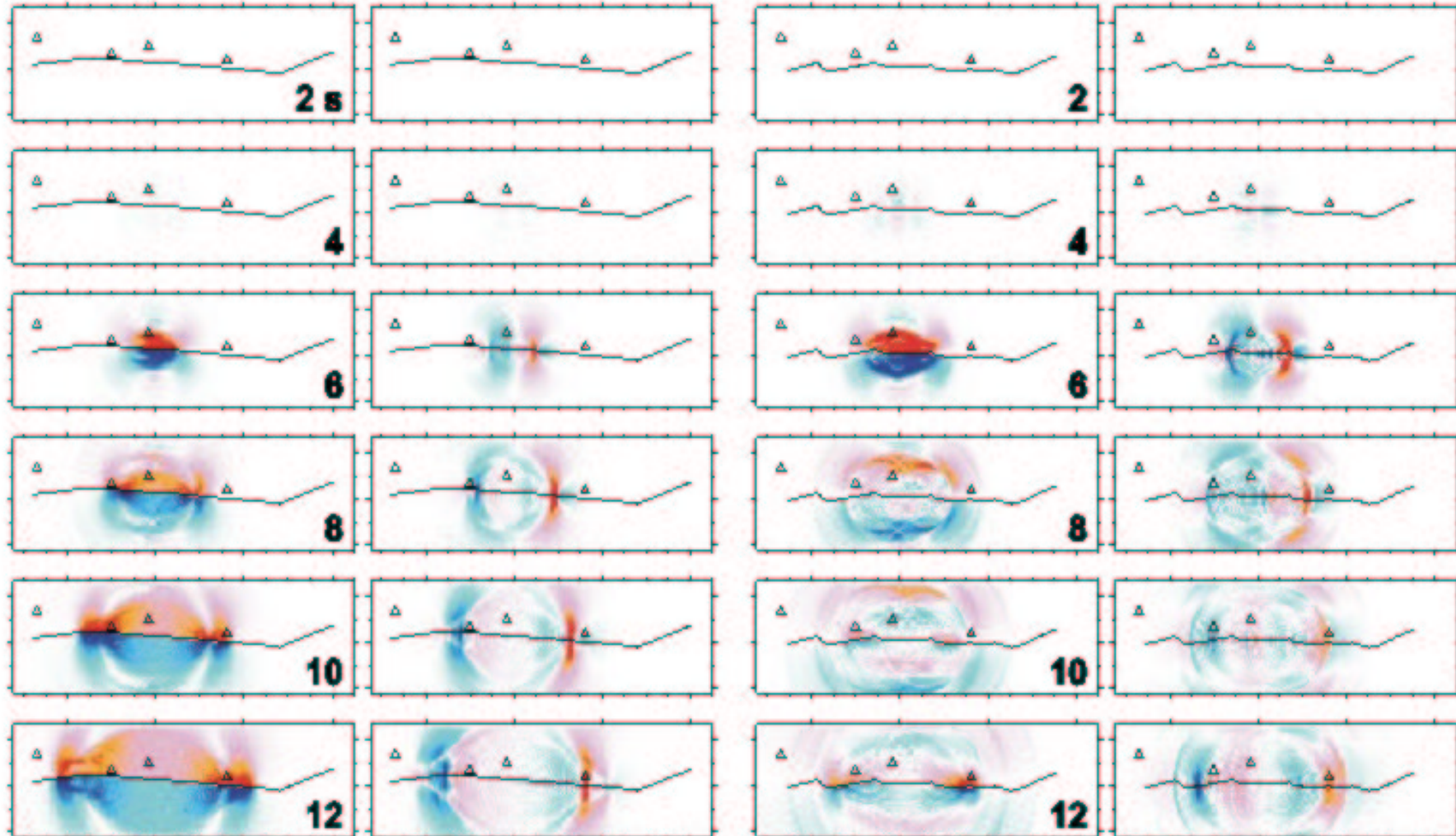
(5) Model E

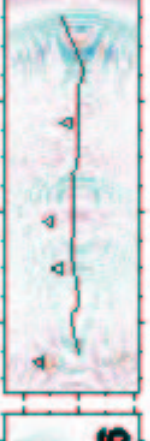
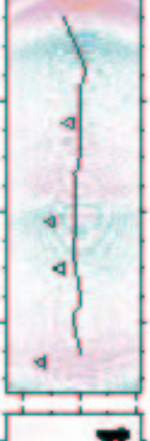
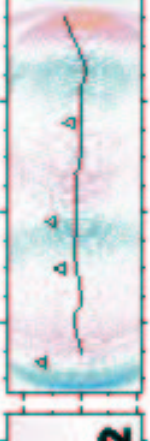
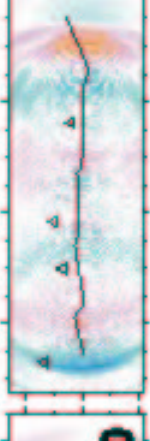
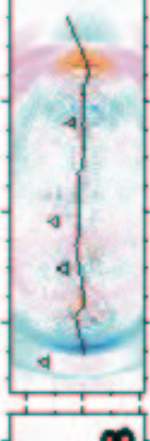
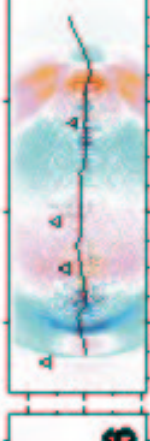
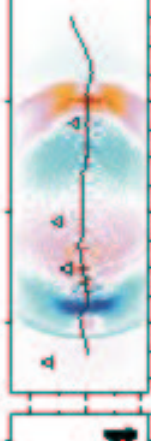
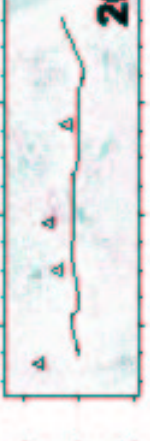
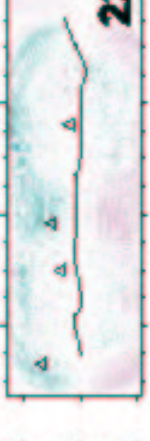
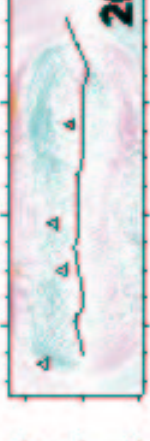
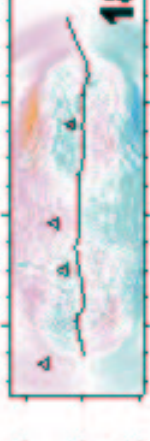
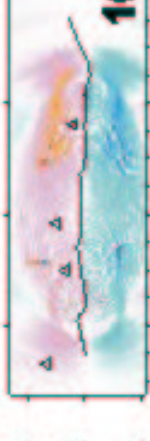
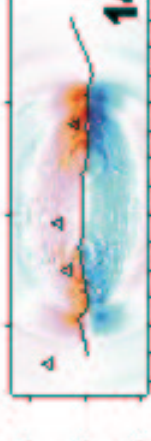
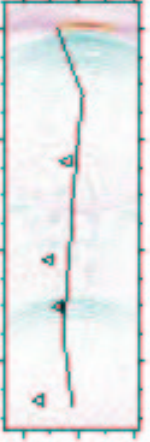
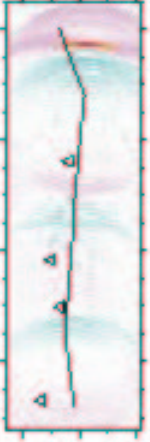
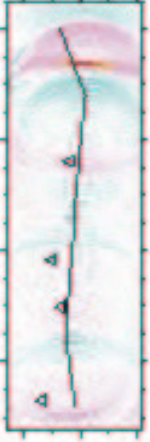
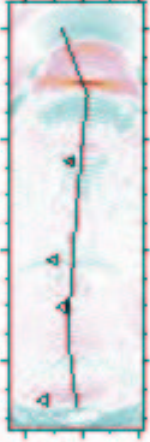
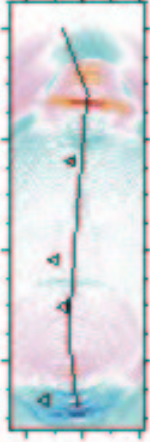
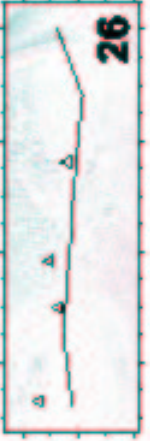
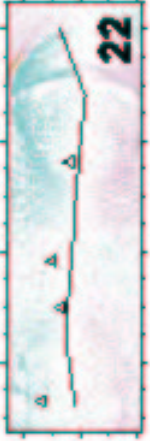
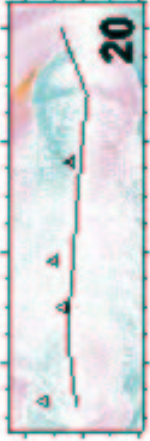
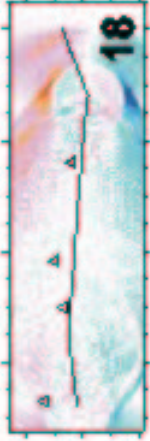
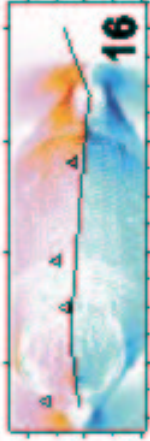
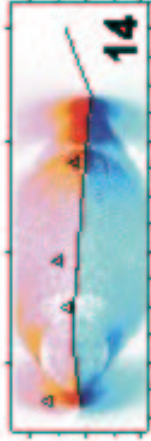
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SEG-EAGE Data Cube

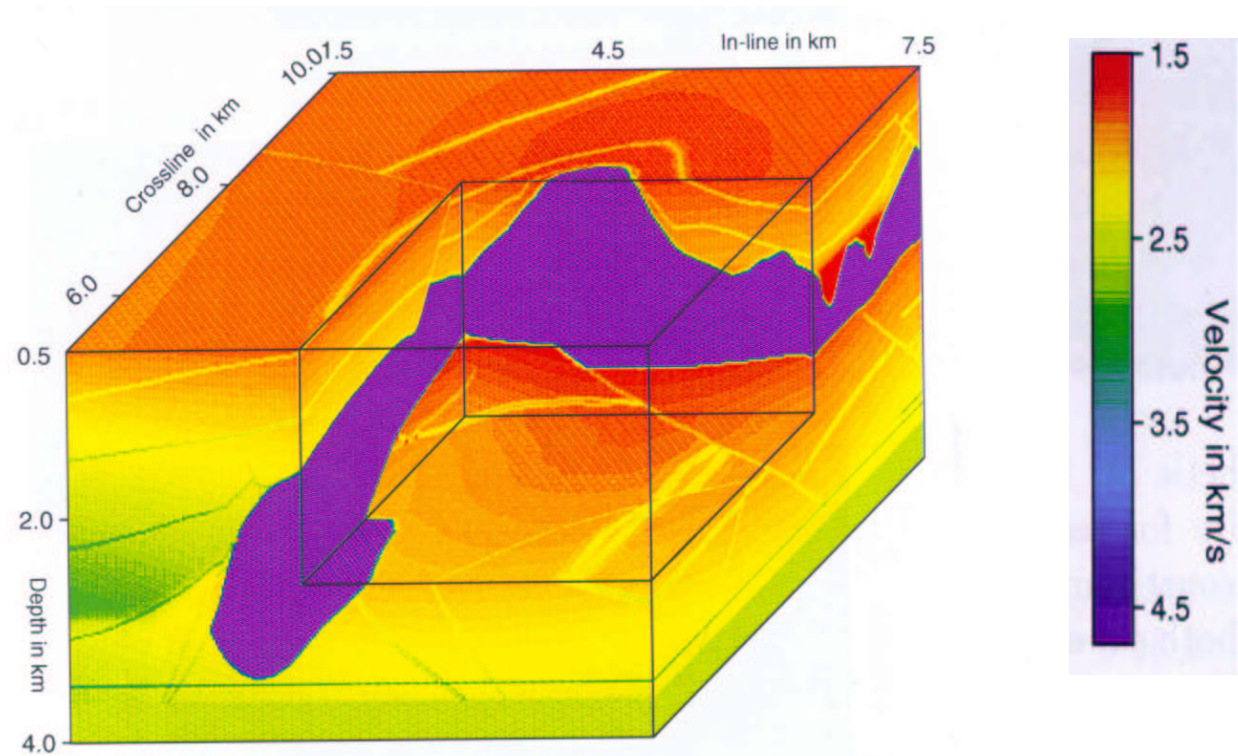
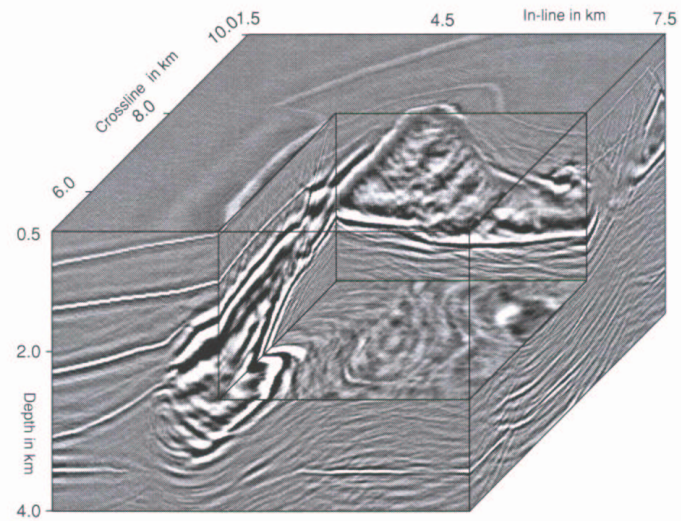
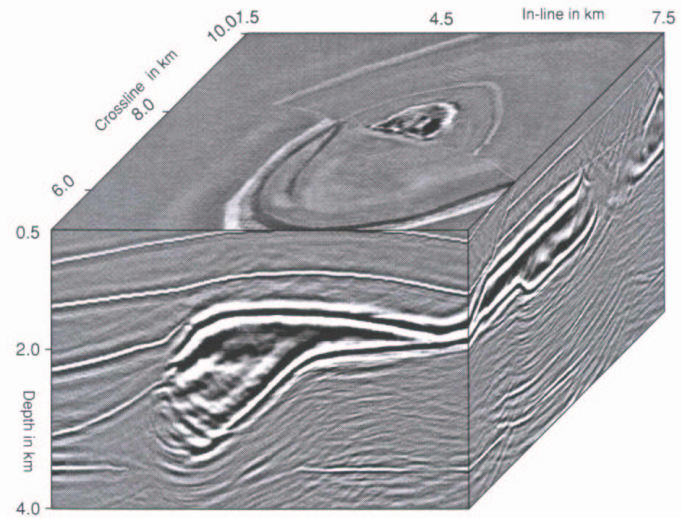


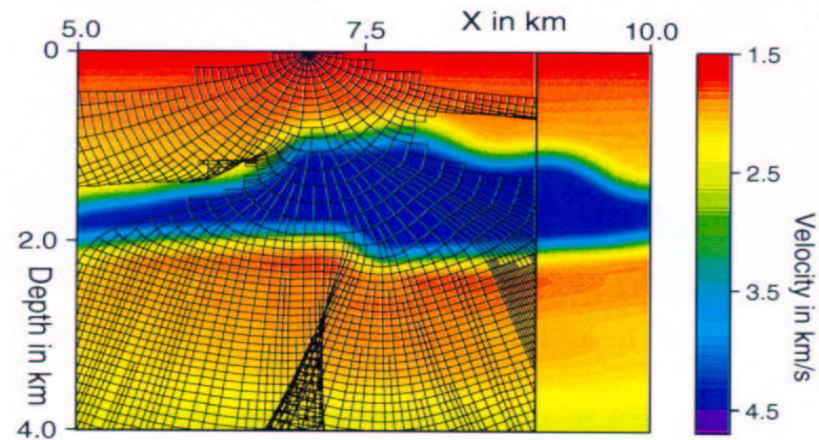
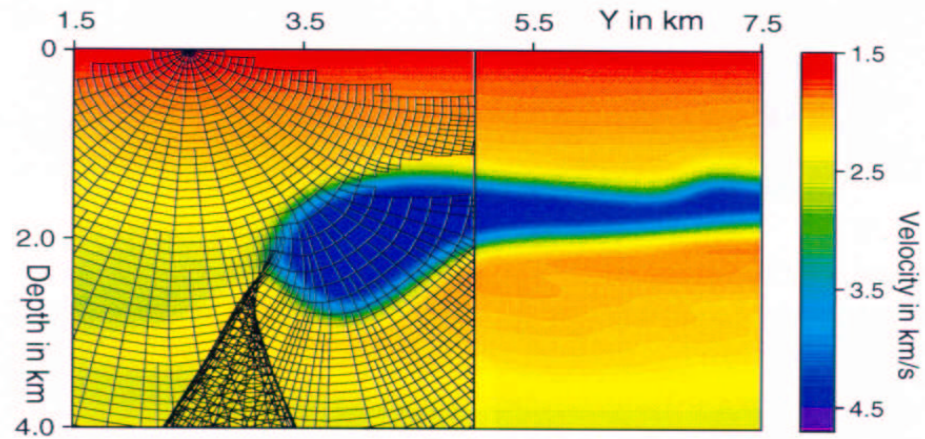
FIG. 6.9: *Velocity cubes in the 3D SEG/EAGE Salt model.*

Poststack migration of the SEG-EAGE cube



Xu & Lambaré, 2001

Ray tracing in the SEG-EAGE model



Xu & Lambaré, 2001