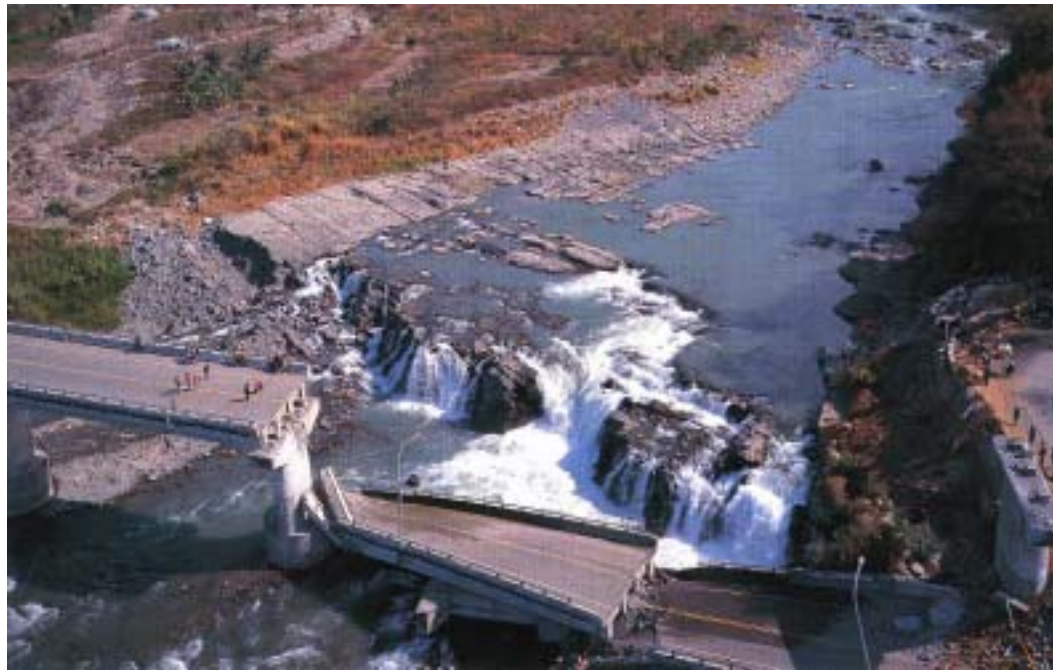


Important (*Source*) Issues in Estimating Strong Ground Motions from Large Earthquakes

James Mori, *Disaster Prevention Research Inst., Kyoto Univ.*



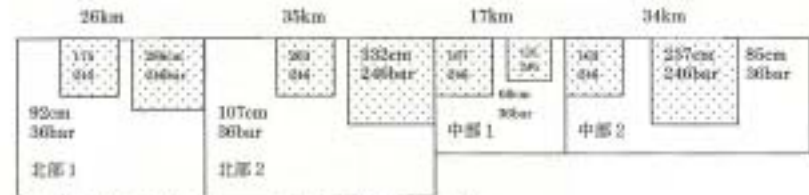
- 
1. What are the largest ground motions that we can expect from large earthquakes ?
 2. What is the frequency content of the ground motion ?

‘Irikura Recipe’

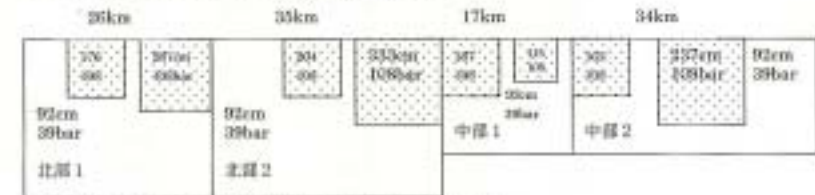
ケース 1 $M_0=7.9 \times 10^{26} \text{ dyne} \cdot \text{cm}$ ($M_j=7.8$ 相当) $f_{\text{max}}=13.5 \text{ Hz}$



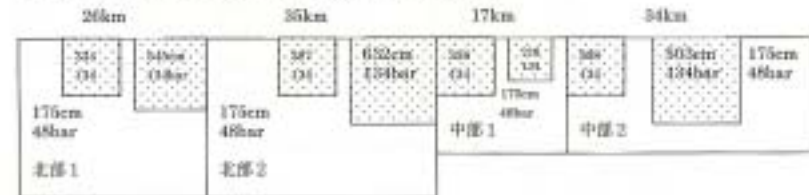
ケース 2 $M_0=7.9 \times 10^{26} \text{ dyne} \cdot \text{cm}$ ($M_j=7.8$ 相当) $f_{\text{max}}=13.5 \text{ Hz}$



ケース 3 $M_0=7.9 \times 10^{26} \text{ dyne} \cdot \text{cm}$ ($M_j=7.8$ 相当) $f_{\text{max}}=6 \text{ Hz}$



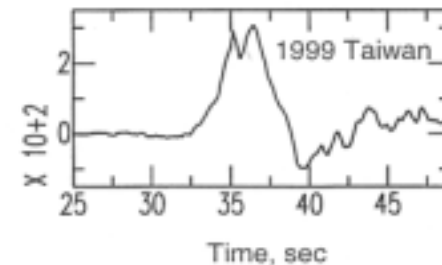
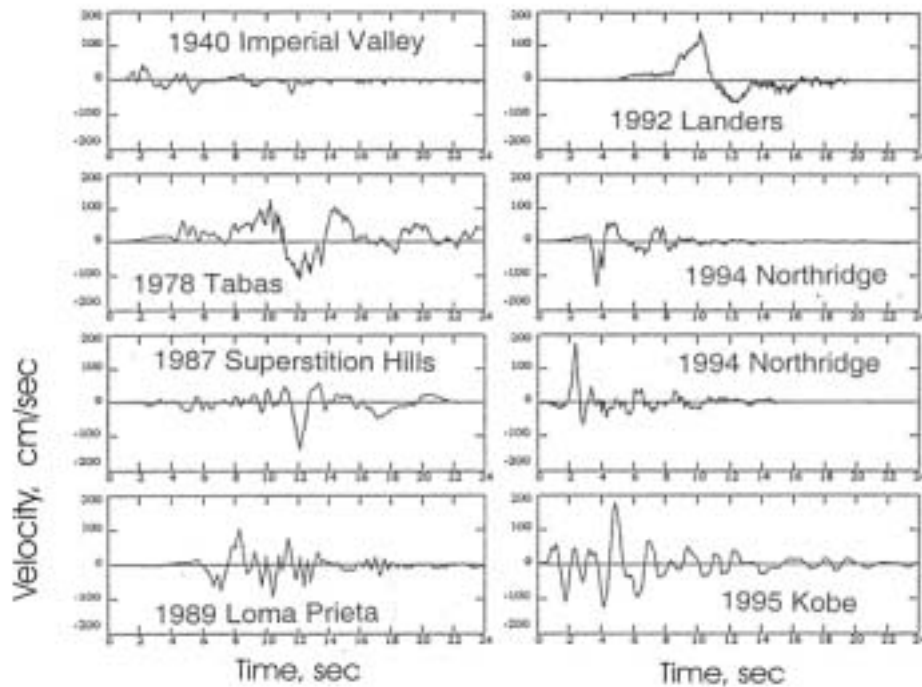
ケース 4 $M_0=1.5 \times 10^{27} \text{ dyne} \cdot \text{cm}$ ($M_j=8.1$ 相当) $f_{\text{max}}=6 \text{ Hz}$



Itoigawa-Shizuoka Kozo-sen Fault Zone

Have we seen the largest ground motions?

Ground-Motion Velocity from Large Earthquakes

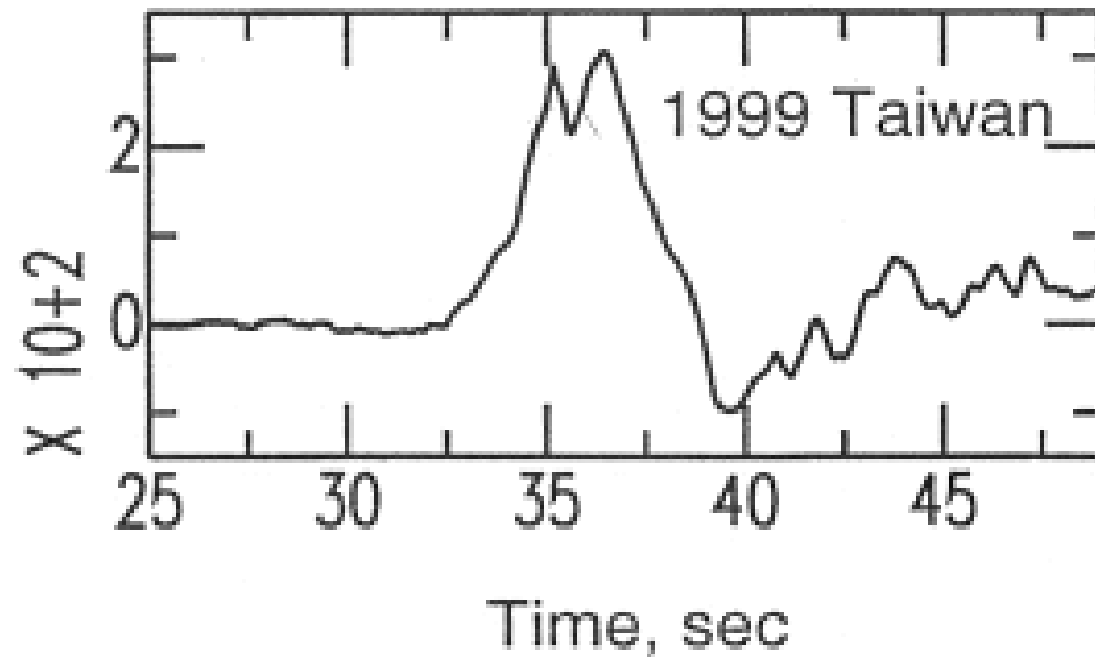


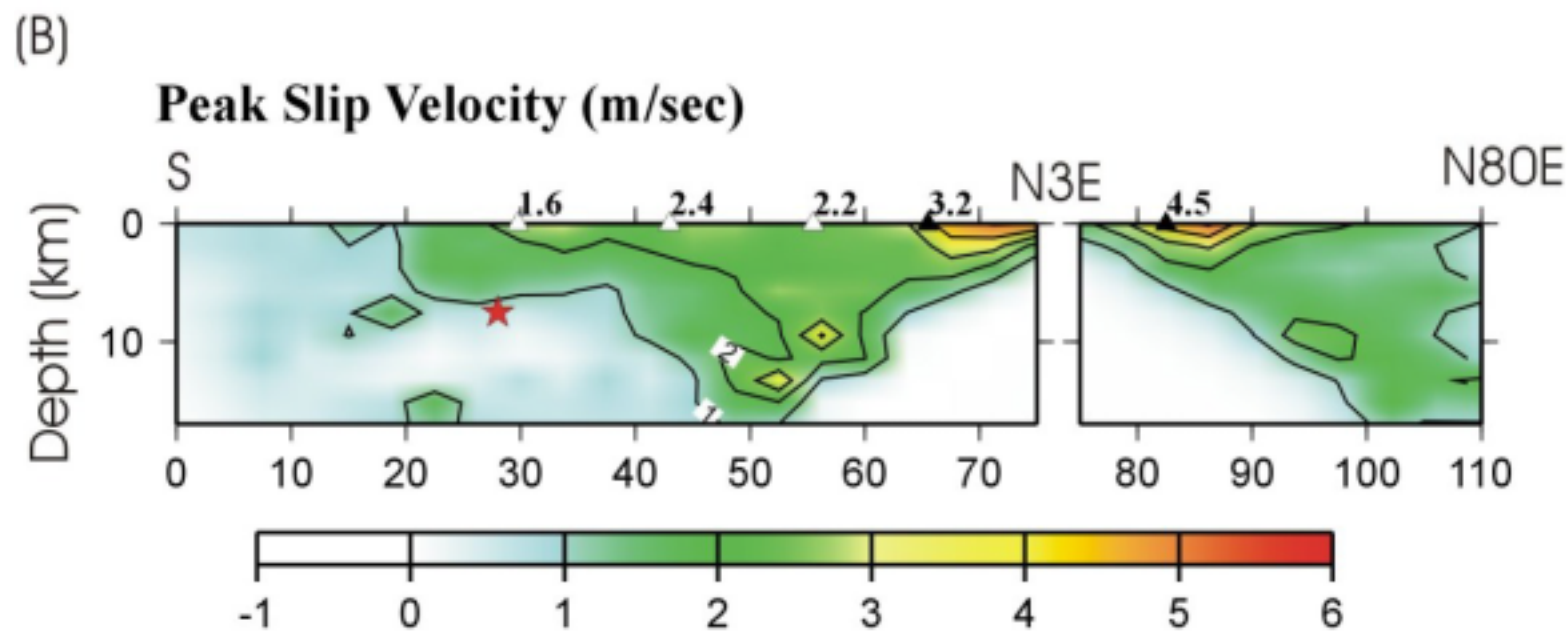
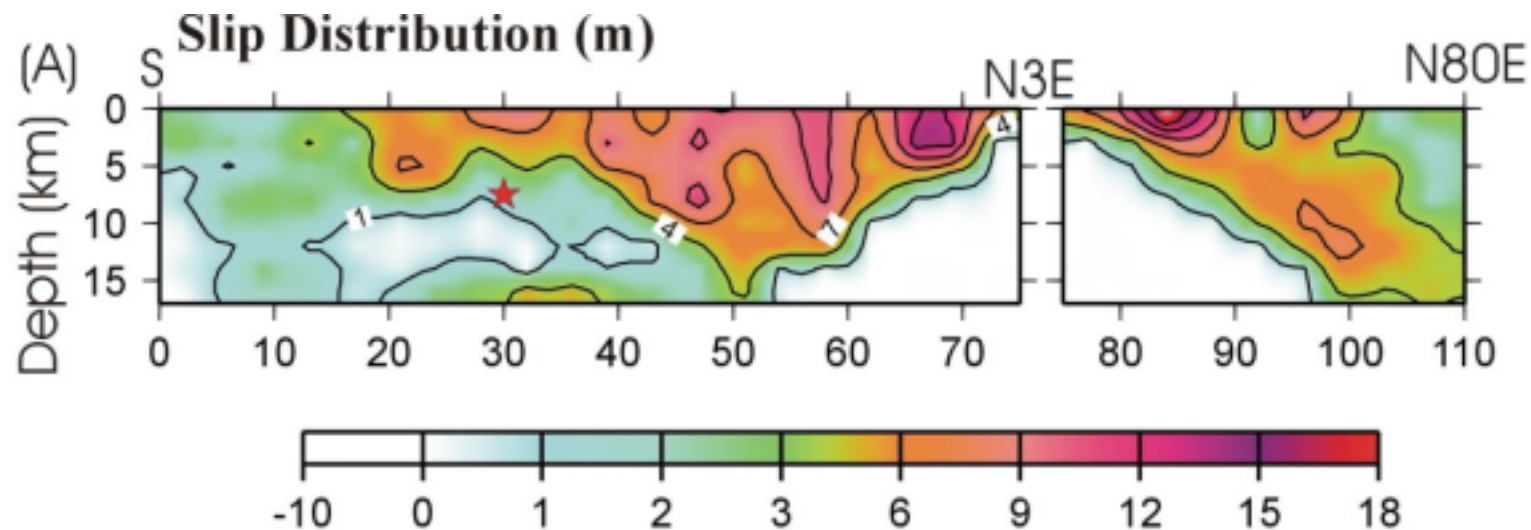
Heaton et al., 1996

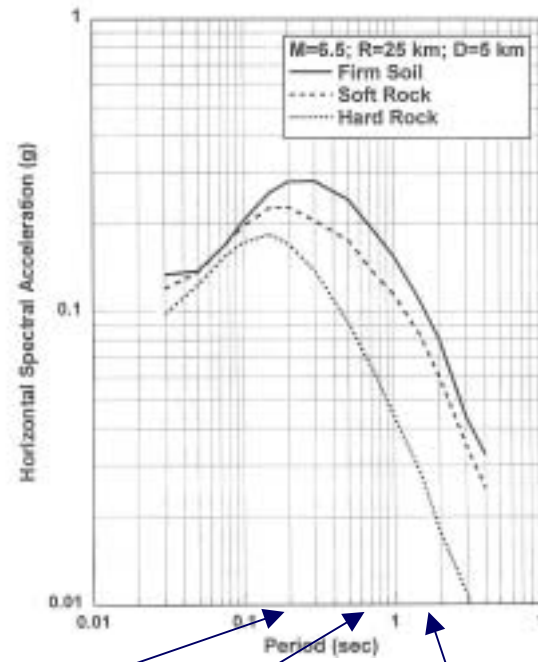
Near-field Ground Velocity is proportional to
Fault Slip Velocity

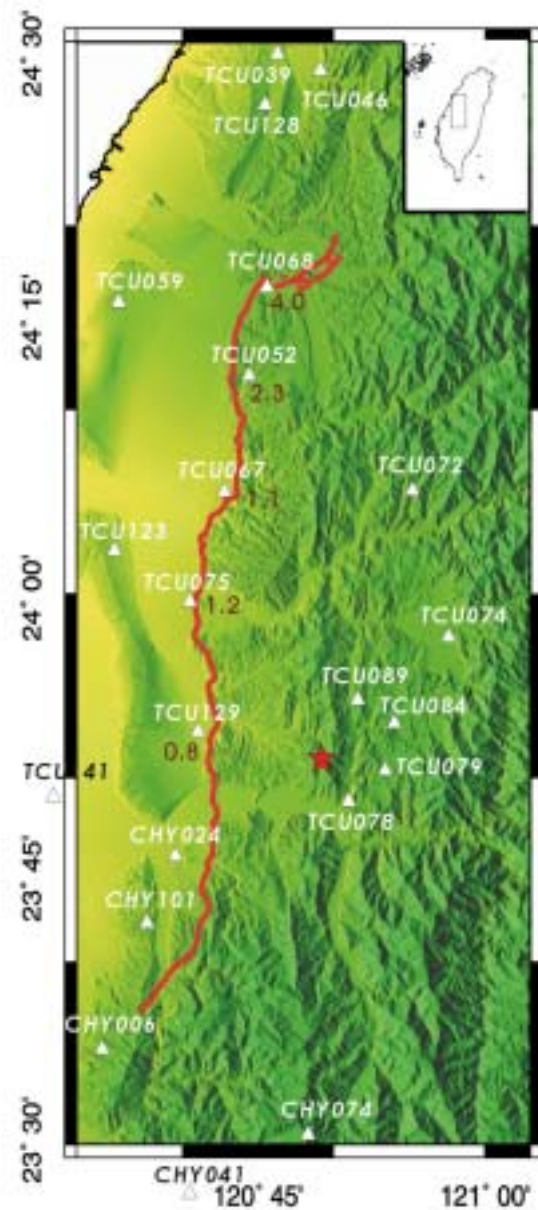
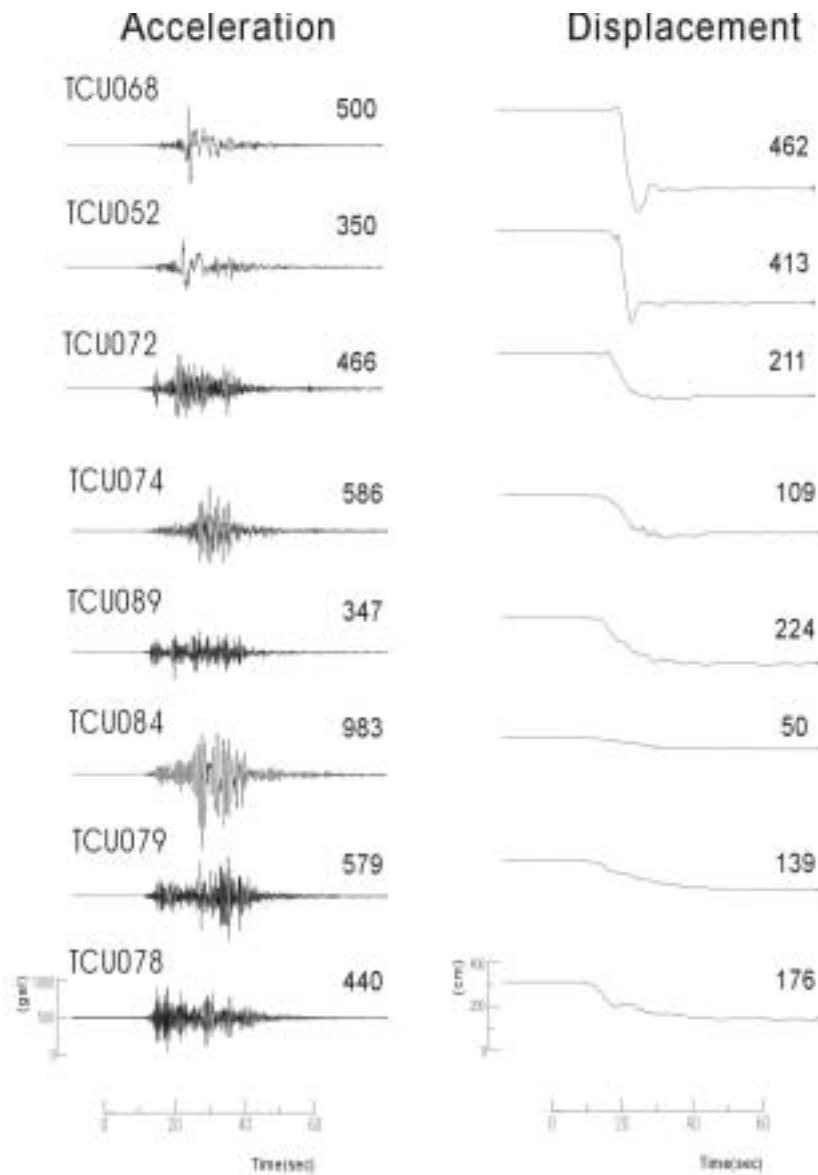
⇒ Important to estimate slip velocity distribution
for large earthquakes

Have we seen the largest ground motions?











Brick wall close to fault



Damaged Government Building

Fault scarp near ChunHsingHsinTsun

Damage differs greatly along fault

In North

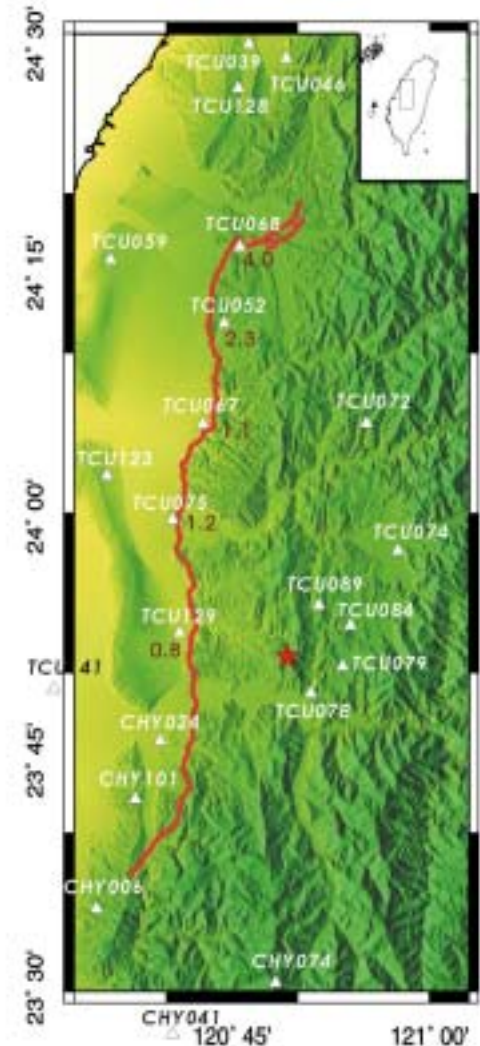
- Very large displacement
- Very large velocity
- Low high frequency

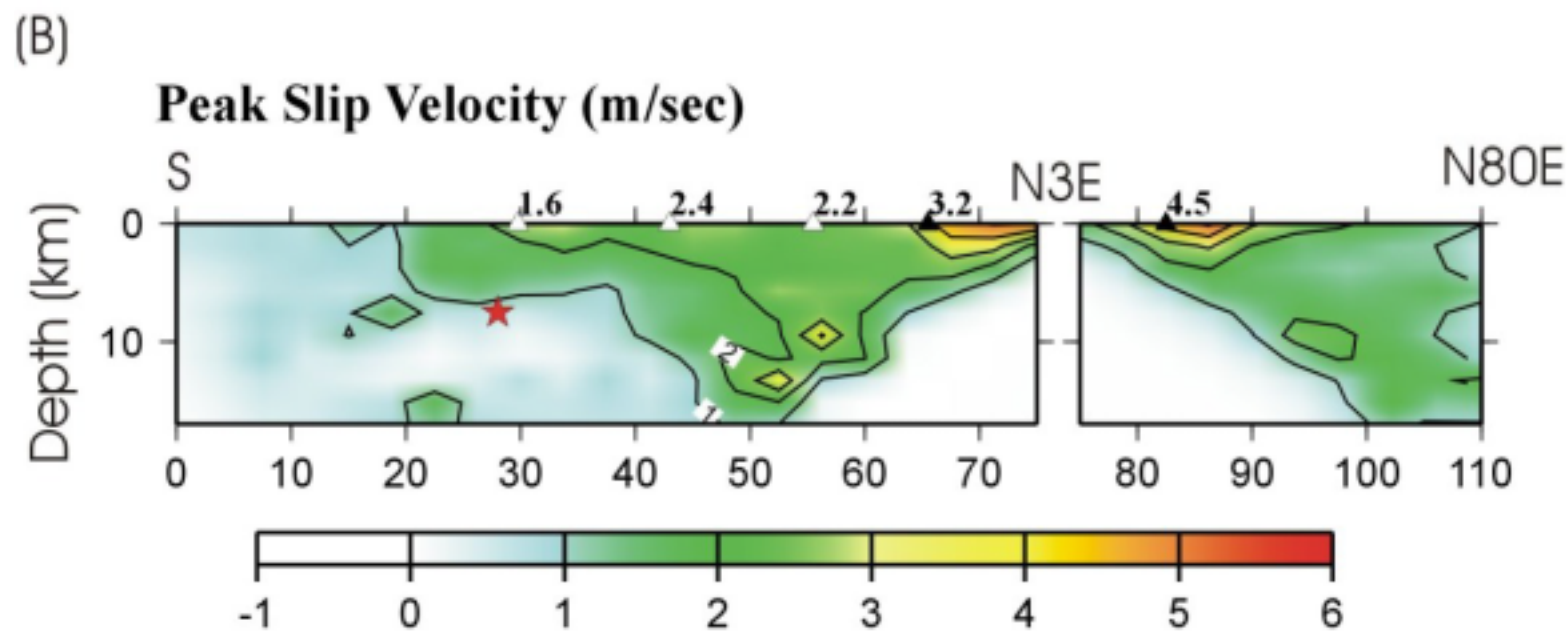
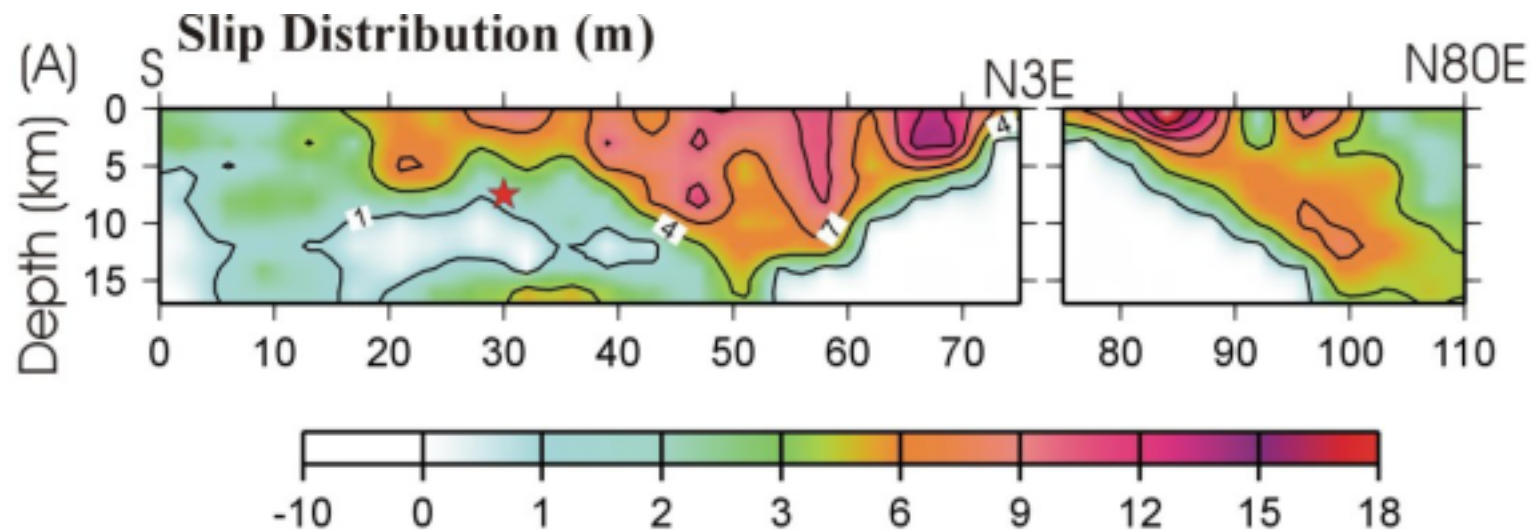
⇒ Low damage to small buildings

In South

- Moderate displacement
- Moderate velocity

⇒ High damage to small buildings





Conclusions



1. Need estimates of fault slip velocities to evaluate maximum amplitudes of ground motions
2. Need to investigate frequency content for different parts of the fault

