# Terremoto

**EN**
La Isla de Haití, o Sucesos Memorables, del día 7 de Mayo 1842.

Referencia: por el Capitán J. R. Márquez a Sint Domingo el 19 de Mayo de 1842.

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## Earthquake Details

<table>
<thead>
<tr>
<th><strong>Parameter</strong></th>
<th><strong>Value</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Magnitude</strong></td>
<td>7.0</td>
</tr>
<tr>
<td><strong>Date/Time</strong></td>
<td>Tuesday, January 12, 2010 at 21:53:09 UTC</td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td>18.423°N, 72.445°W</td>
</tr>
<tr>
<td><strong>Depth</strong></td>
<td>10 km (6.2 miles) set by location program</td>
</tr>
<tr>
<td><strong>Region</strong></td>
<td>HAITI REGION</td>
</tr>
<tr>
<td><strong>Distance</strong></td>
<td>150 km (93 miles) SW of Barahona, Dominican Republic</td>
</tr>
<tr>
<td><strong>Location Uncertainty</strong></td>
<td>horizontal +/- 8.3 km (5.2 miles) depth fixed by location program</td>
</tr>
<tr>
<td><strong>Parameters</strong></td>
<td>Mw=7.0, b=0.06, Dmin=385.7 km, Rms=4.44, ω=94°</td>
</tr>
<tr>
<td><strong>Source</strong></td>
<td>USGS.NEEC (WDCS-D)</td>
</tr>
</tbody>
</table>
Where?

Preliminary Determination of Epicenters
358,214 Events, 1963 - 1998
Major Tectonic Plates of the World
EF: Enriquillo-Plaintain Garden Fault
SF: Septentrional Fault
The Haitian presidential palace stands in ruins Tuesday, January 12, in Port-au-Prince after a magnitude-7.0 earthquake hit Haiti, toppling buildings and causing widespread damage and panic.

Reporters de Vineiro was headed down a mountain near Port-au-Prince when he arrived to feel some shaking. He snapped this photo.

Carol Nadie took these photos while searching for her daughter in Petionville, a suburb of Port-au-Prince. She was found alive and well.
CAPTIVE COLUMN

\[ V = \frac{\Sigma M_p}{L_e} = \frac{2M_p}{L_e} \]

Reduced column effective length due to infills
Structural Analysis

- Simplicity: “Make it as simple as possible but not simpler.” [Precision ≠ Accuracy.]
- Efficiency: “80% of the answer is fairly easy to get; next 10% is very difficult; remaining 10% is impossible to get.”
- “If you are going get only an approximate answer, then get it as simply as possible.”
MODELING

- Reading and interpreting drawings is an analyst engineer’s job – need to understand behavior of elements and their inter-action as a system
Force-Displacement Curves

Force (F) vs. Displacement (Δ)

[Graph showing multiple curves representing force-displacement relationships]
MODELING/ANALYSIS

- MODEL versus REALITY
  (Anybody can assume!)
LOADING

• Statics, Dynamics – assumptions
MODEL MISMATCH

• MODEL versus REALITY
  – Need to consider someone else’s “irrelevants”
  – Nature does not care about our assumptions.
CAPTIVE COLUMN

\[ \frac{\Sigma M_p}{L_e} = \frac{2M_p}{L_e} \]

REDUCED COLUMN EFFECTIVE LENGTH DUE TO INFILLS
BOUNDARY CONDITION ASSUMPTIONS

• MODEL versus REALITY
  – How fixed is fixed support?
  – What do we know about site soil conditions? Factors of safety.
Alaska (Turnagain Heights zone)