



AD FALCON API Manual

PML Example — Coupled Dynamic Impulse (Implicit)

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Plane-strain large domain used for PML impulse benchmark

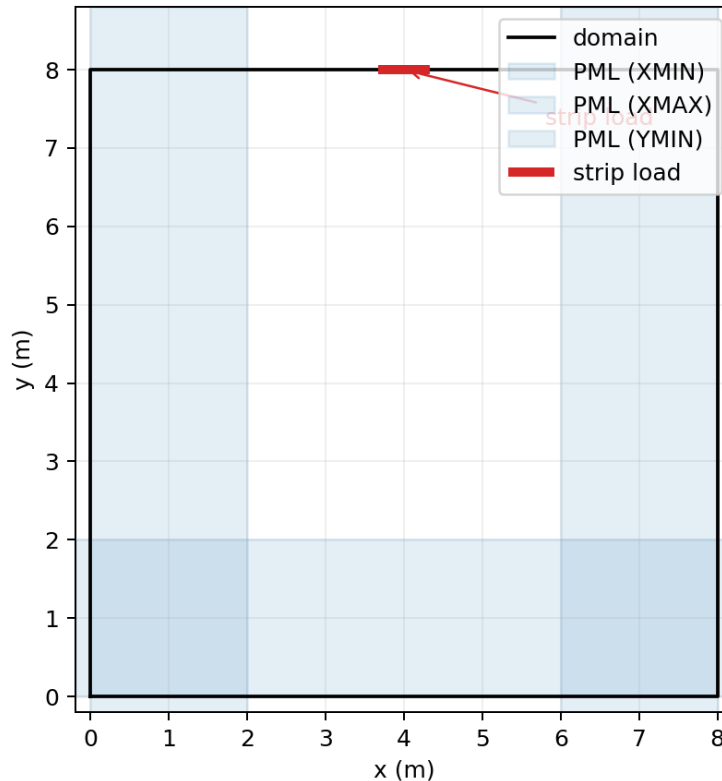


Figure 1: Geometry + PML placement

1 PML Example — Coupled Dynamic Impulse (Implicit)

This page repeats the impulse benchmark for a **coupled plane-strain dynamic** analysis (solid + pore water).

1.1 Model summary

- Geometry: **8 m × 8 m plane-strain** domain ($x \in [0, 8], y \in [0, 8]$)
- Load: short **tabular (bipolar) impulse** applied as a strip load at the top surface
- Time integration: **implicit** (@@SimMode: Dynamic, @@TimeIntegration: Implicit)
- Comparison: **truncated** vs **PML on XMIN, XMAX, YMIN**

1.2 Loading used

The base files define the strip load magnitude via `NormalPressures ...` on the top edge. To better expose boundary reflections, a short **bipolar impulse** is applied via a **tabular load factor**:

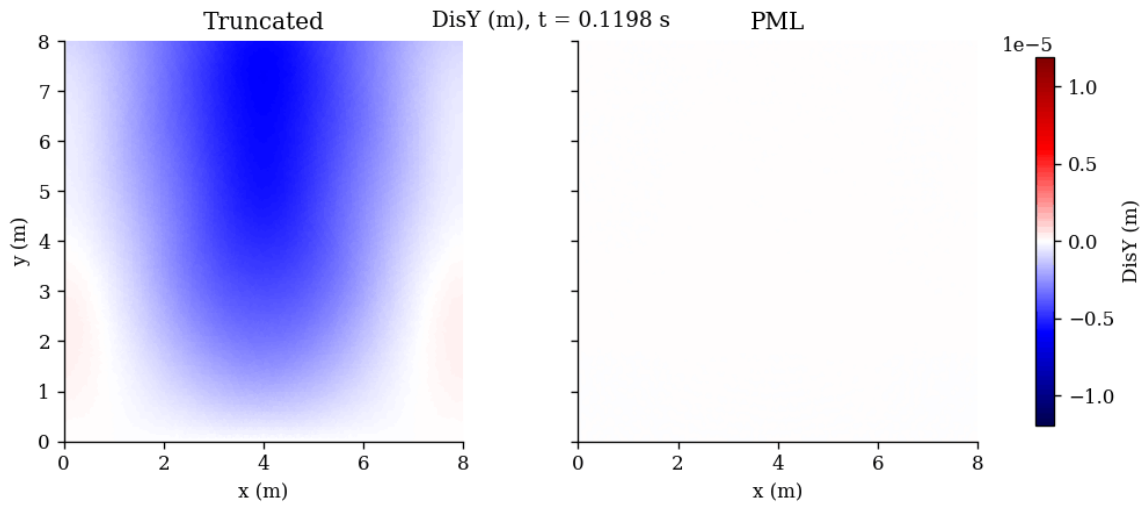


Figure 2: DisY evolution: truncated vs PML (side-by-side)

- LoadType Tabular Step 1
- TabularData 0 0; 0.001 1; 0.002 -1; 0.003 0; 0.12 0

Here $dt = \text{StepTime} / \text{NumberSteps} = 0.12 / 1000 = 1.2e-4 \text{ s}$.

1.3 Results

The animation below shows the **DisY** field evolution side by side for the same impulse load:
Figure: DisY field evolution for the same impulse load (left: truncated, right: PML).

Note: animated GIFs loop in the **web** version of the manual. In the **PDF** export, animations are typically rendered as a single (static) frame.

The plot below shows the **applied pressure time history** alongside **several DisY probes** (truncated vs PML), including a probe close to the PML boundary and probes in the interior.

Figure: Applied pressure history (top) and DisY probe responses (bottom) for truncated vs PML.

Pore-water pressure transients at probe points (% PointStateOutput, truncated vs PML):

Figure: Applied pressure history (top) and PW probe responses (bottom) for truncated vs PML.

1.4 Input files

- Truncated: [pml_impulse_large_pl_coupled_truncated.txt](#)
- With PML: [pml_impulse_large_pl_coupled_pml.txt](#)

See also: [Perfectly Matched Layer \(PML\)](#)

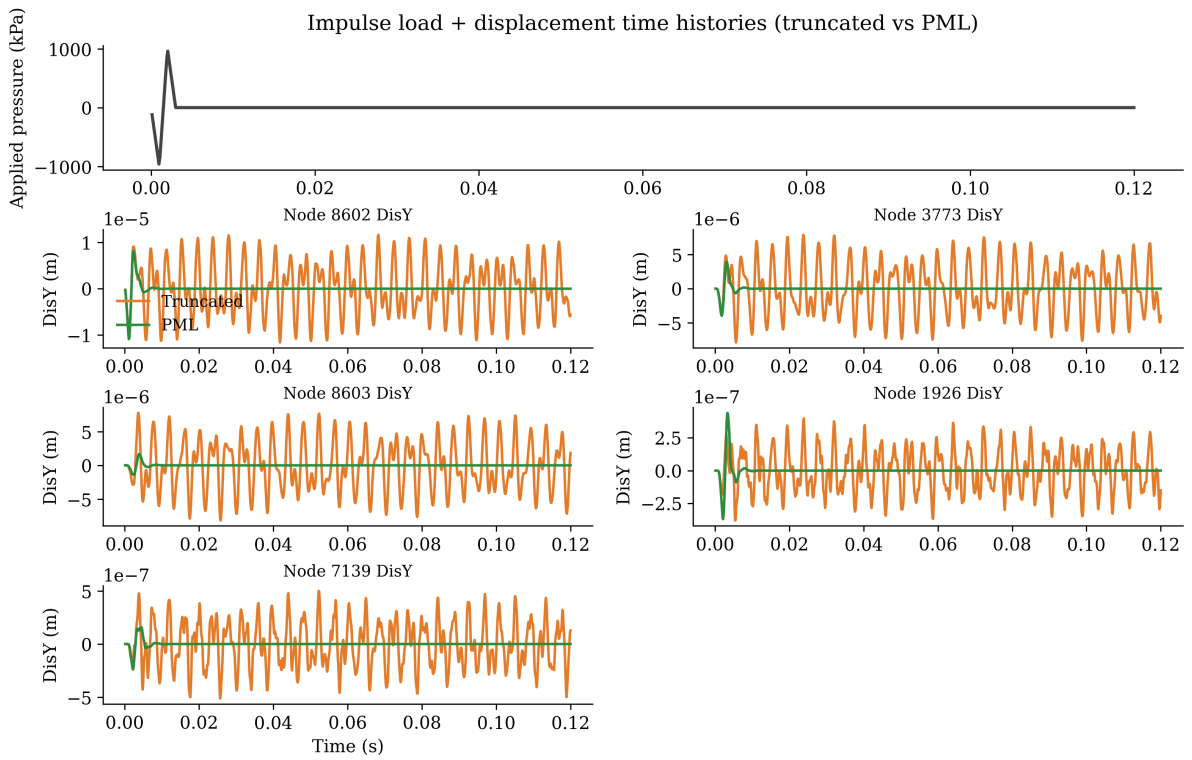


Figure 3: Plane-strain coupled DisY impulse response

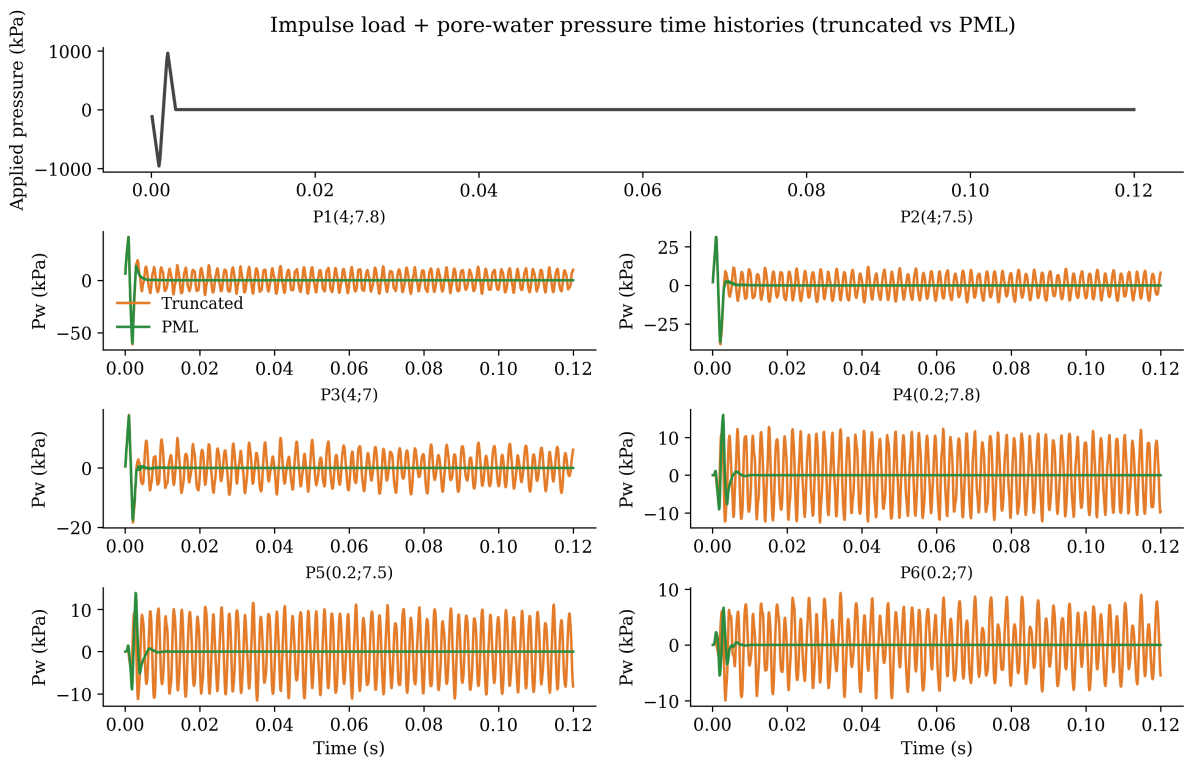


Figure 4: Plane-strain coupled PW impulse response