

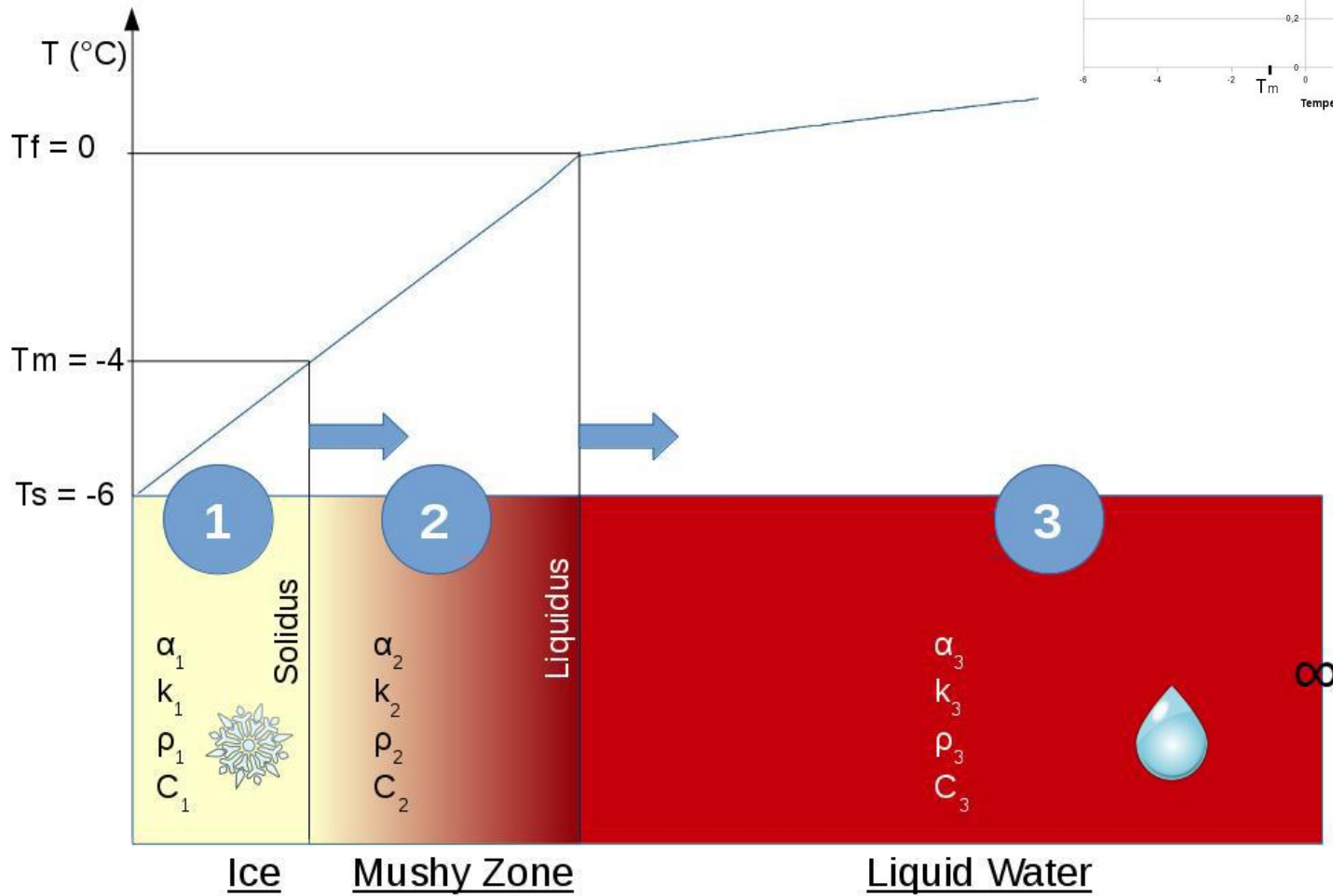
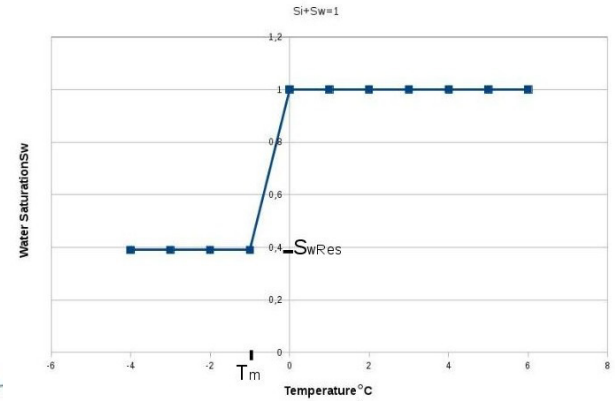
# LSCE preliminary results: convergence tests on the T1 Lunardini case

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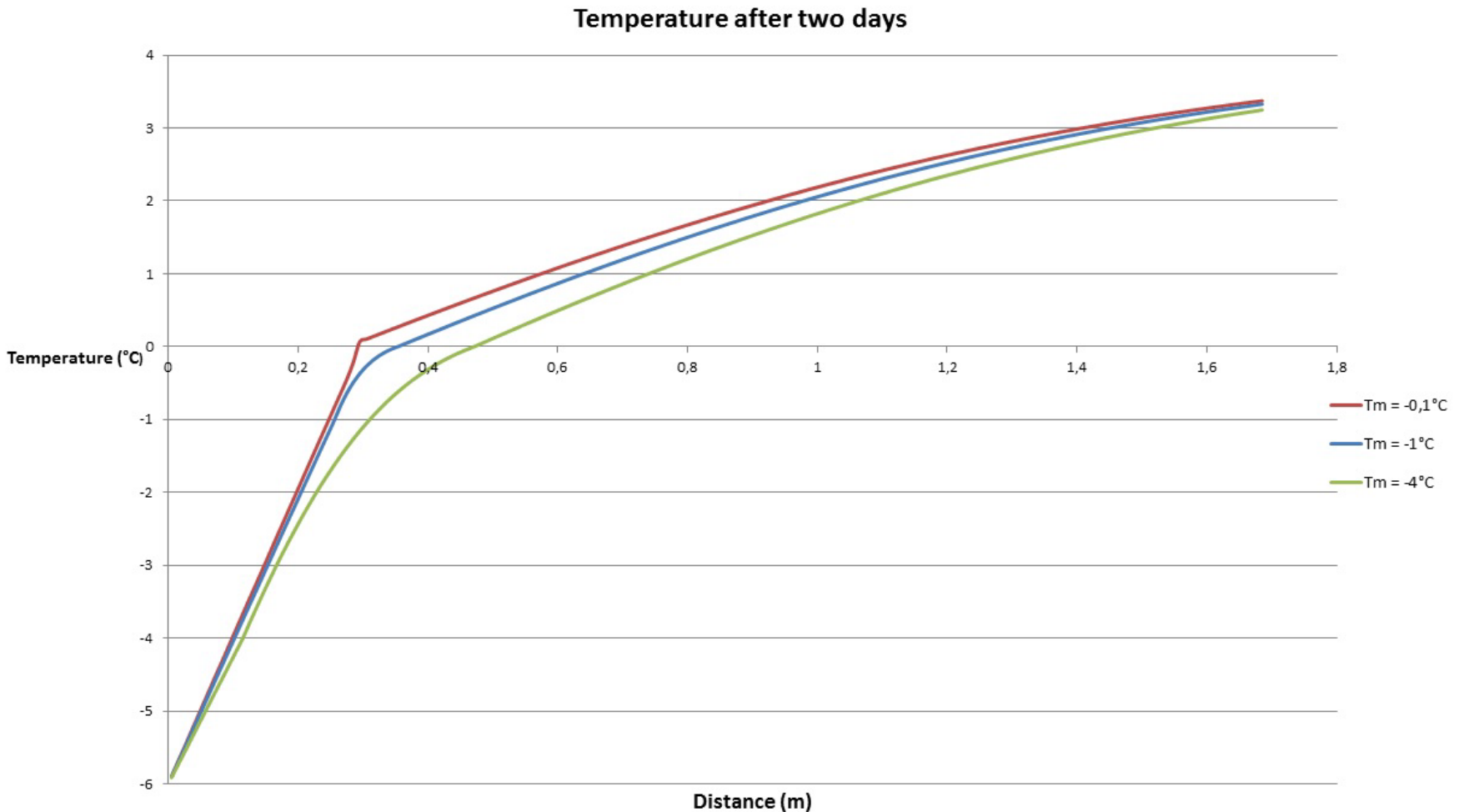


# Lunardini case

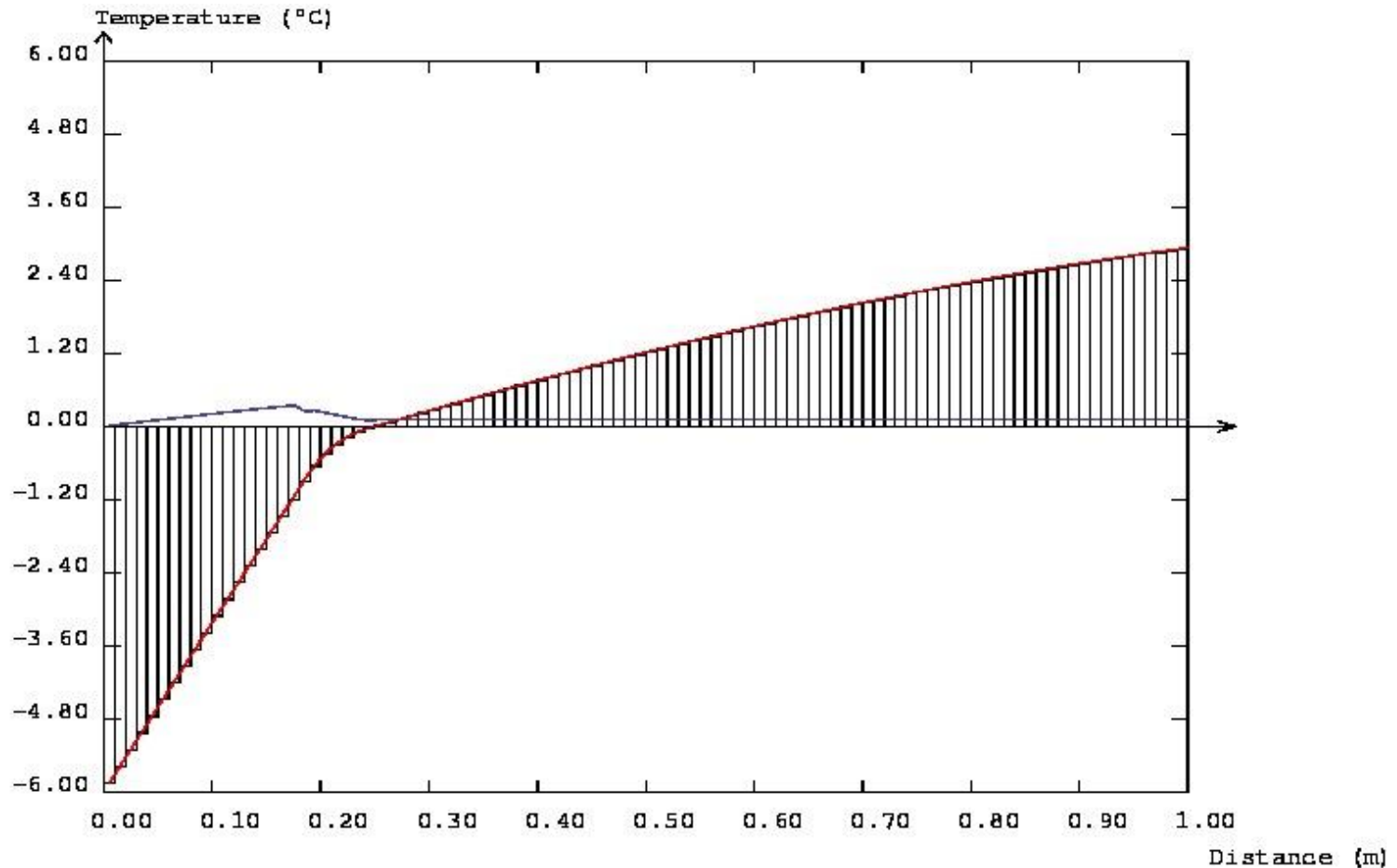
Freezing function for  $T_m = -1^\circ\text{C}$



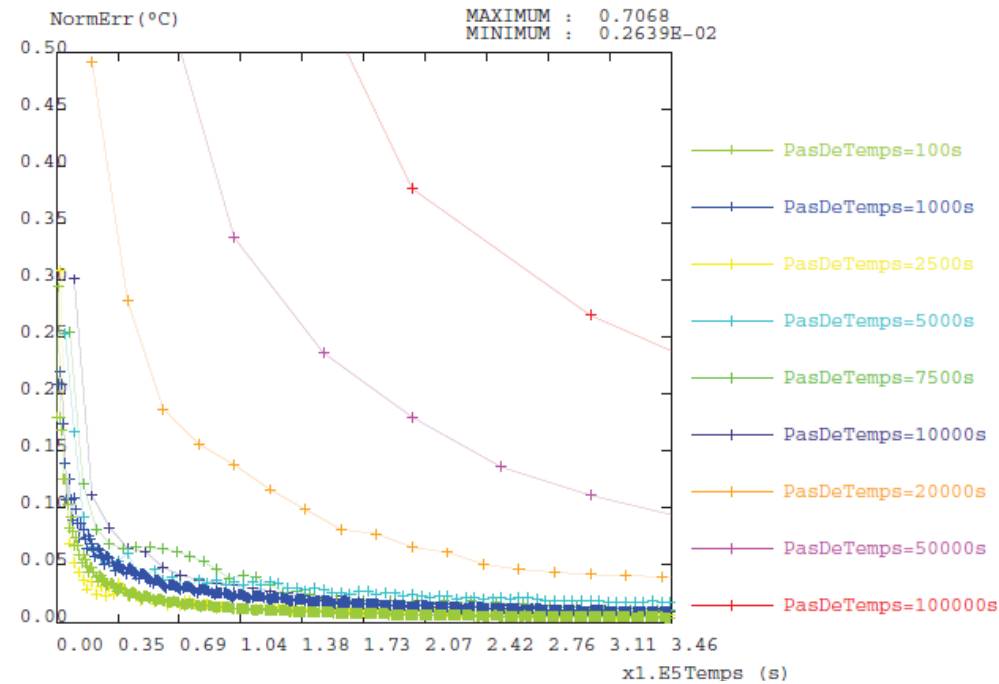
# Analytical solutions for different $T_m$ values ( $T(x, t=2 \text{ days})$ )



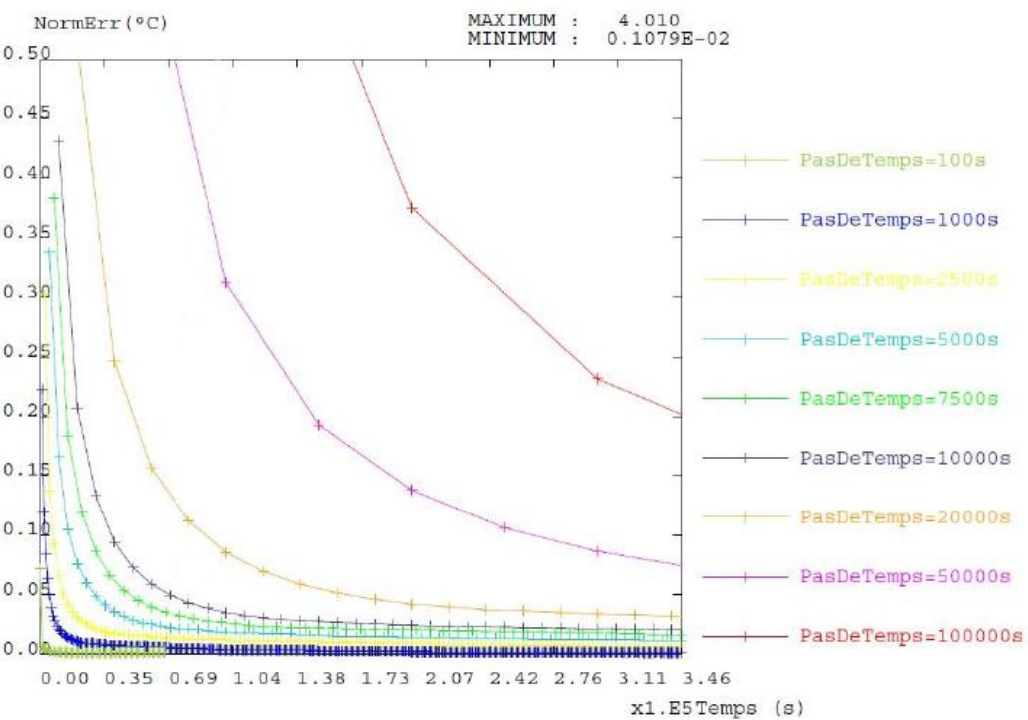
# Code vs analytical solution: 750 meshes, after 1 day

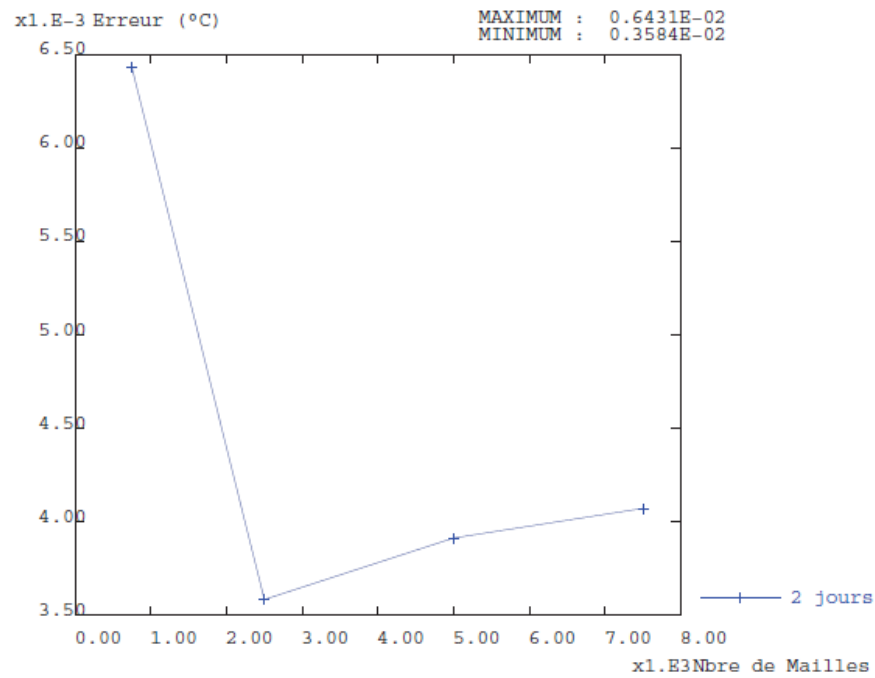


$$\text{Max } |T_{num} - T_{anal}| = 0.02^{\circ}\text{C}$$

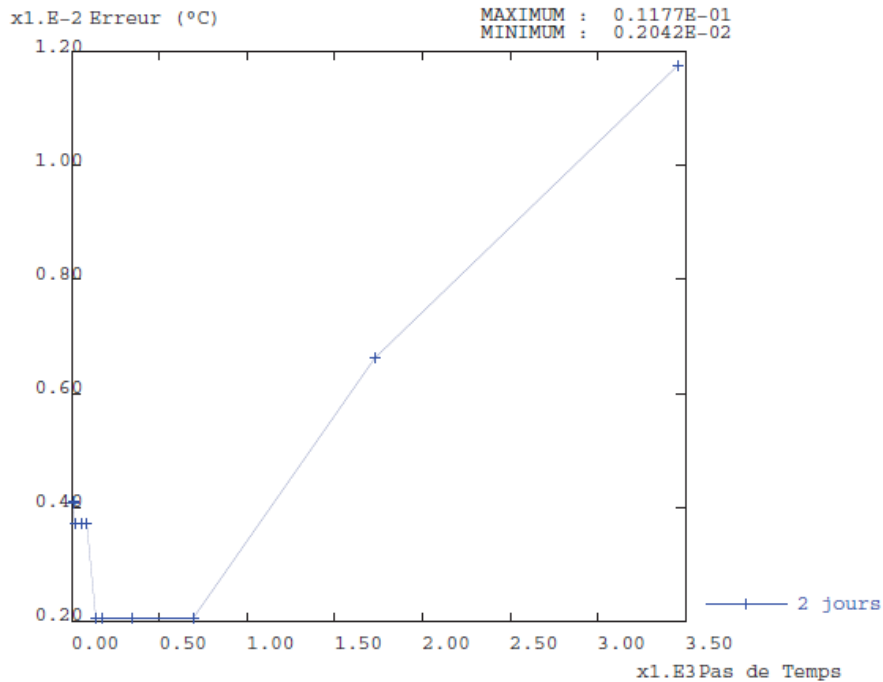


Time  
convergence for  
750 and 7500  
elements





# Space and time convergences



# Other points studied

- Sensitivity to Picard convergence threshold value
- Sensitivity to various initial conditions
- Sensitivity to  $T_m$  values

# Conclusions

- Conduction with phase change validated
- Spatial and temporal convergence achieved (with incompressible bounds)
- Cases with different  $T_m$  all ran with more difficulties for low values leading to steeper fronts