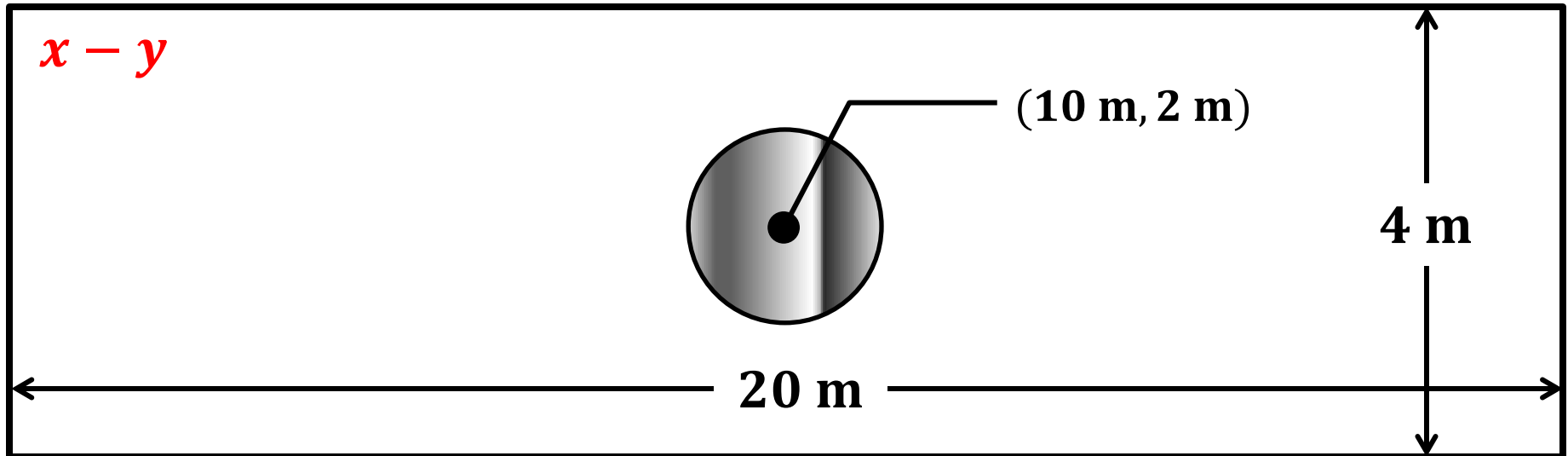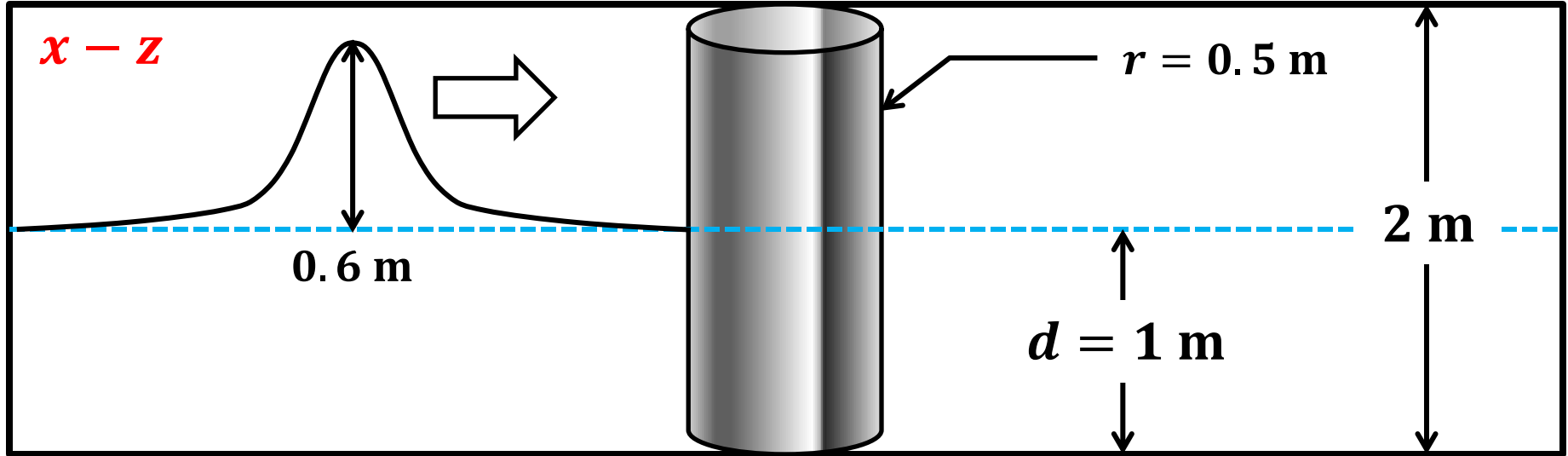# Soliton-cylinder interaction – IITM-RANS3D

NS Mesh-size planned for the simulation: $500 \times 50 \times 100 \Rightarrow \delta x = 0.04 \text{ m}$
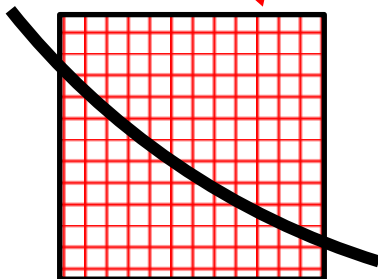
$$f_{solid} = 0$$

$$(x - a)^2 + (y - b)^2 = r^2$$

Any point is "inside" if:
$$(x - a)^2 + (y - b)^2 < r^2$$
Any point is "outside" if:
$$(x - a)^2 + (y - b)^2 > r^2$$

$$f_{solid} = 1$$

Cell intersected by the surface of the cylinder is further divided into 200^3 **SUBCELLS** and the number of SUBCELLS falling inside the solid are counted.

One-way "weak" coupling strategy

- FNPT mesh moves vertically whilst NS grid is fixed. $\delta x_{NS} \ll \delta x_{FNPT}$

- FNPT data queried over vertical columns spaced $\boldsymbol{0.5\delta x}$ apart to account for staggering of the NS grid

- Time interpolation: $\delta t_{\mathrm{NS}} \ll \delta t_{\mathrm{FNPT}}$ (especially for focused waves)