Selected Topics in CFD - list 6

Paweł Jędrejko

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1.

Consider the following equation:

$$\frac{d^2u}{dx^2} = e^{-x^2}(4x^2 - 2), \qquad x \in [-\pi, \pi]$$

$$u\big|_{x=-\pi} = e^{-\pi^2}, \qquad u\big|_{x=\pi} = e^{-\pi^2}.$$

- How fast does the Jacobi solver converge, and how does the convergence rate depend on the initial guess?

- Is the method guaranteed to converge?

- Implement the method and verify your expectations.