PHYS 325: Computational Physics III

Winter 2023

Exercise 6.2

1. Repeat Exercise 6.1, but now using the *Lax* method:

$$u_j^{n+1} = \tfrac{1}{2}(u_{j+1}^n + u_{j-1}^n) - \frac{v\Delta t}{2\Delta x}(u_{j+1}^n - u_{j-1}^n)\,,$$

again with $v = 1$, comparing with the analytic solution only at time $t = 5$. What is the maximum difference between the two solutions at this time? How does your solution change if $\Delta t = 0.05$, $\Delta t = 0.2$?