Simulation of Poiseuille Flow Using the Lattice Boltzmann Method (LBM)

MASTER OF TECHNOLOGY

by

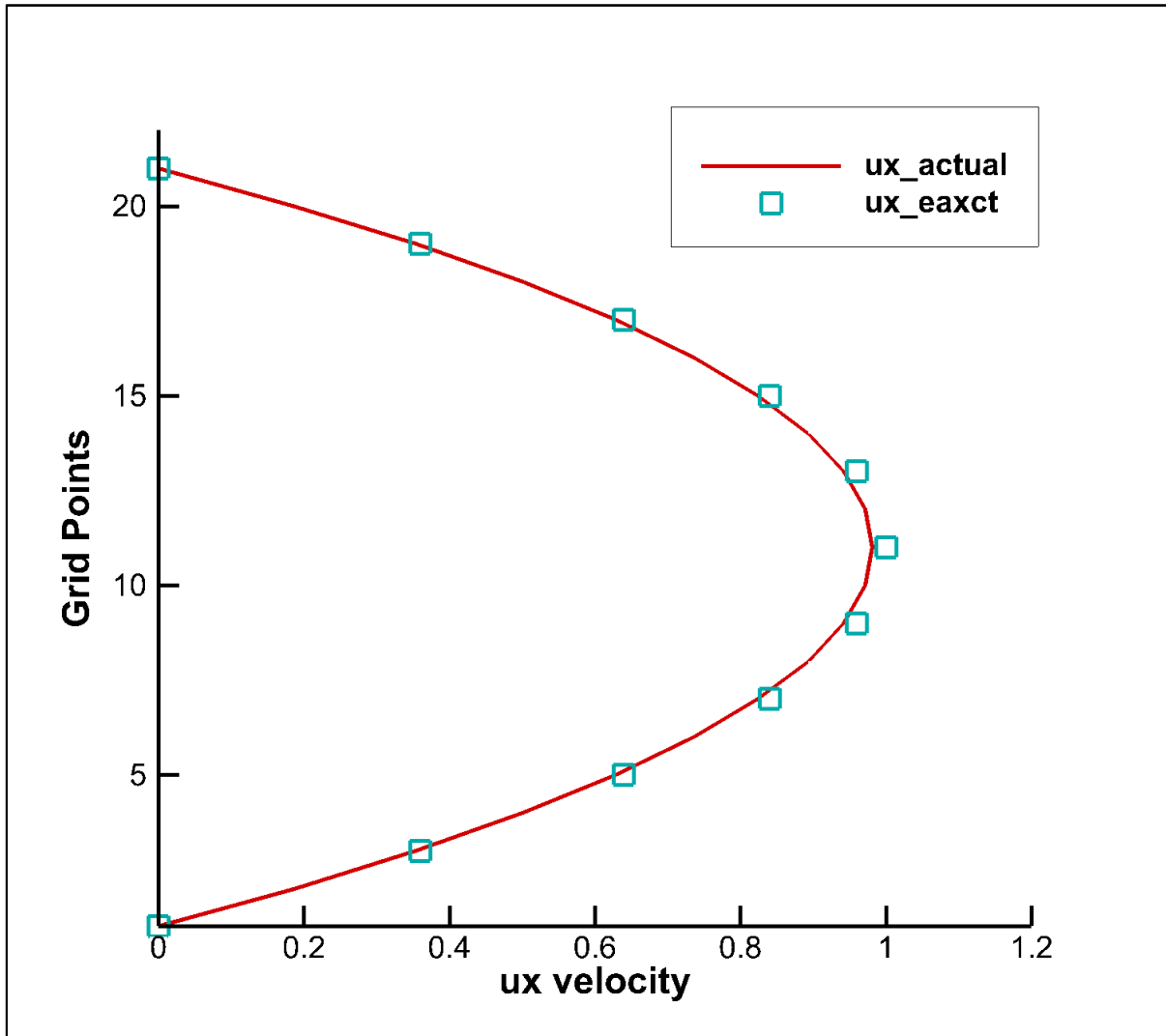**Devendra Chaudhari**

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DEPARTMENT OF MECHANICAL ENGINEERING

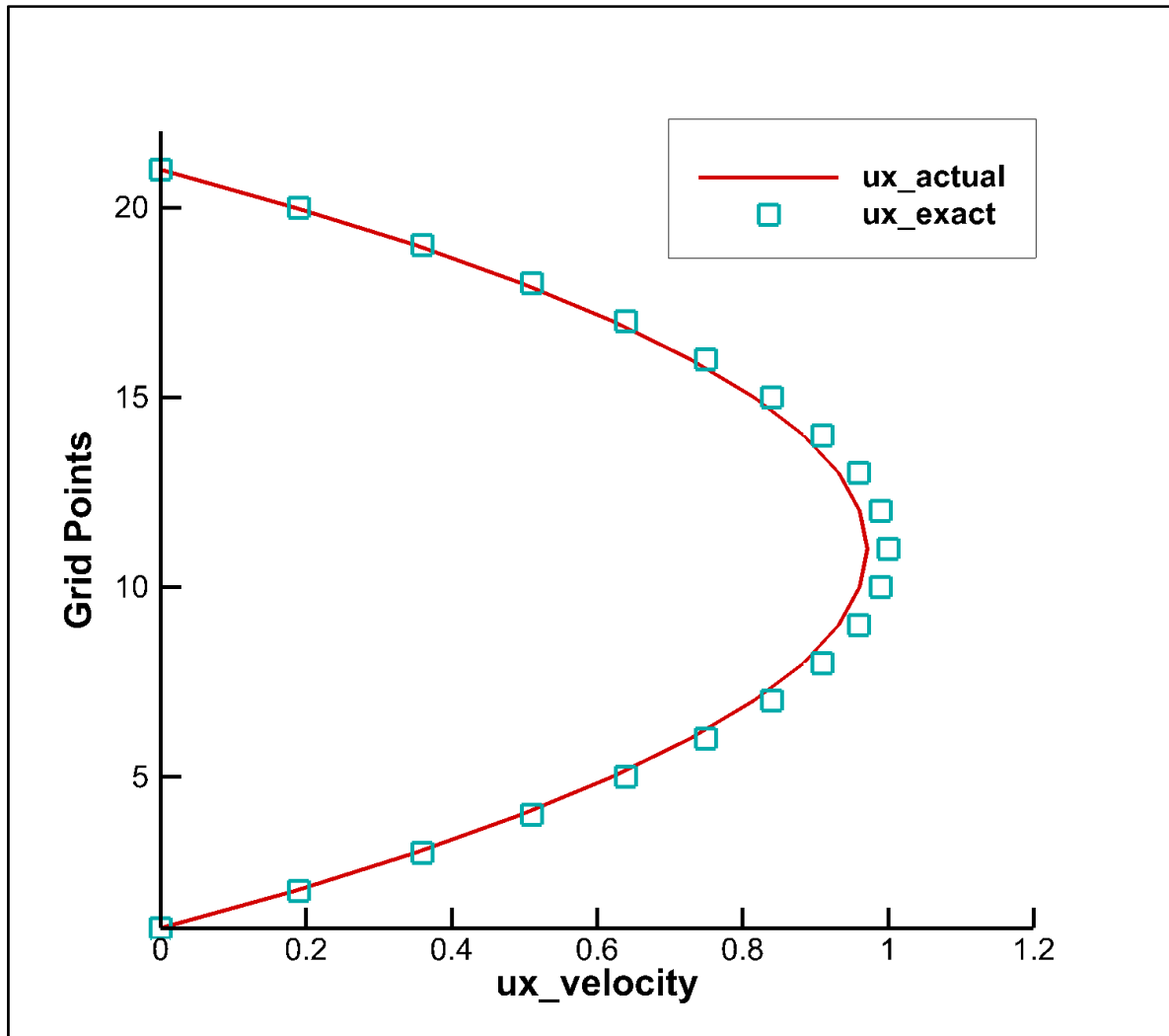**INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI**

GUWAHATI- 781039, INDIA

Results of Poiseuille Flow using NEBB approach:

1. Reynold's number: 20
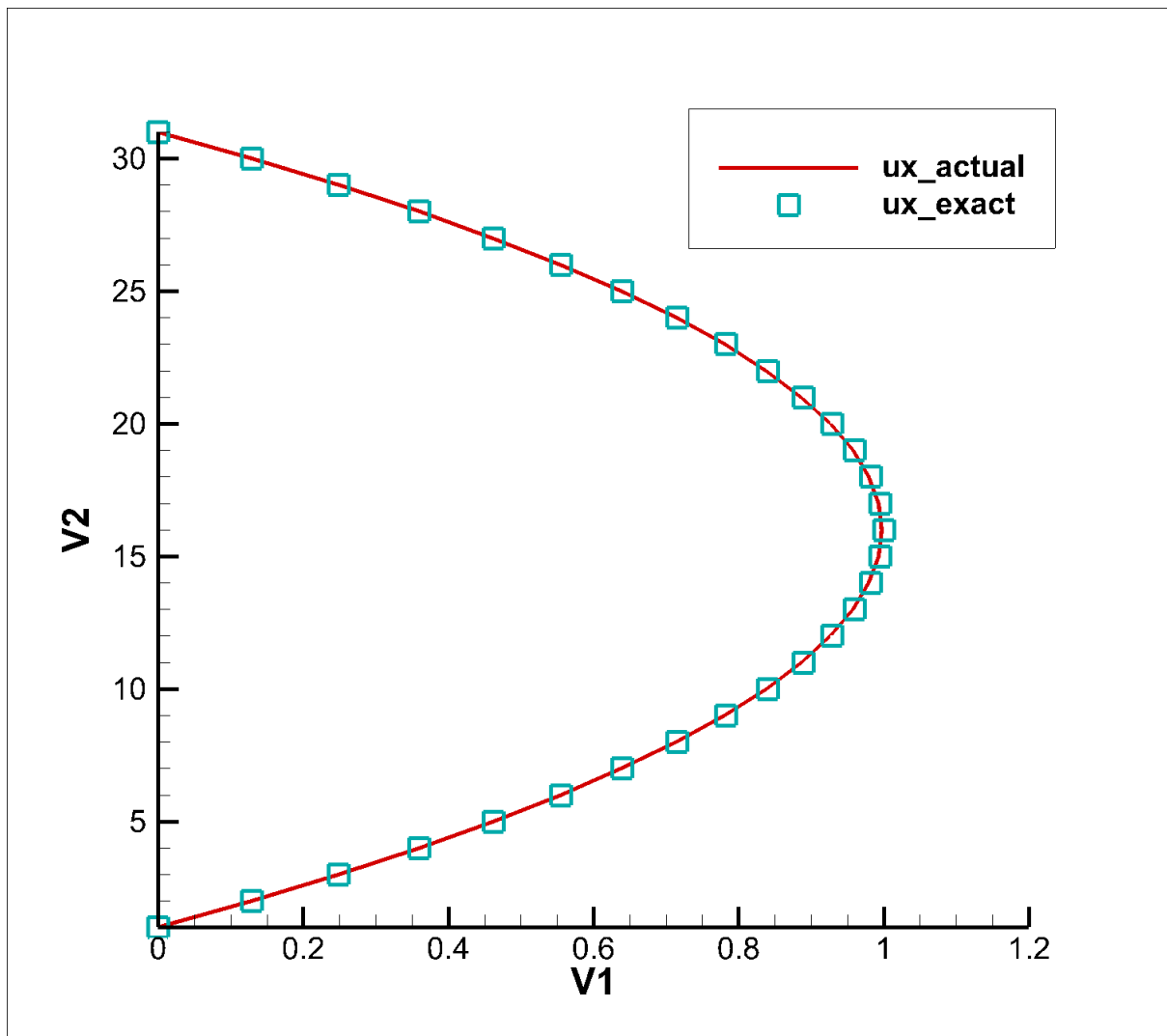   Grid points in y-direction (Ny): 20
   Grid points in x-direction: 10*Ny

u_average	ux_exact	ux_actual	error	
0.666667	1	0.981332	1.90227%	umax_act=1.472u_avg

2. Reynold's number: 40
   Grid points in y-direction (Ny): 20
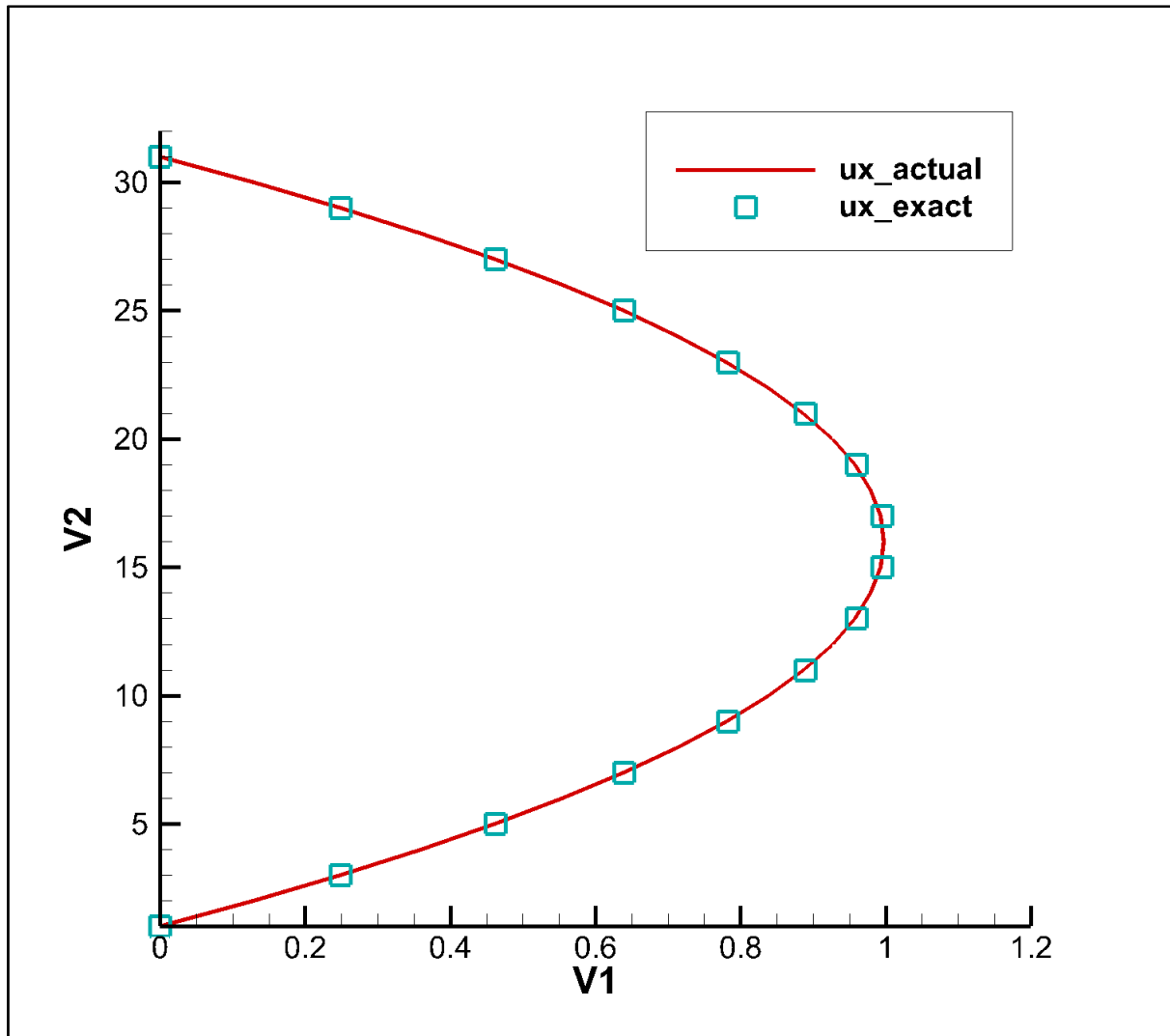   Grid points in x-direction: 10*Ny

u_average	ux_exact	ux_actual	error	
0.666667	1	0.971067	2.97955%	umax_act=1.4566u_avg

3. Reynold's Number:20
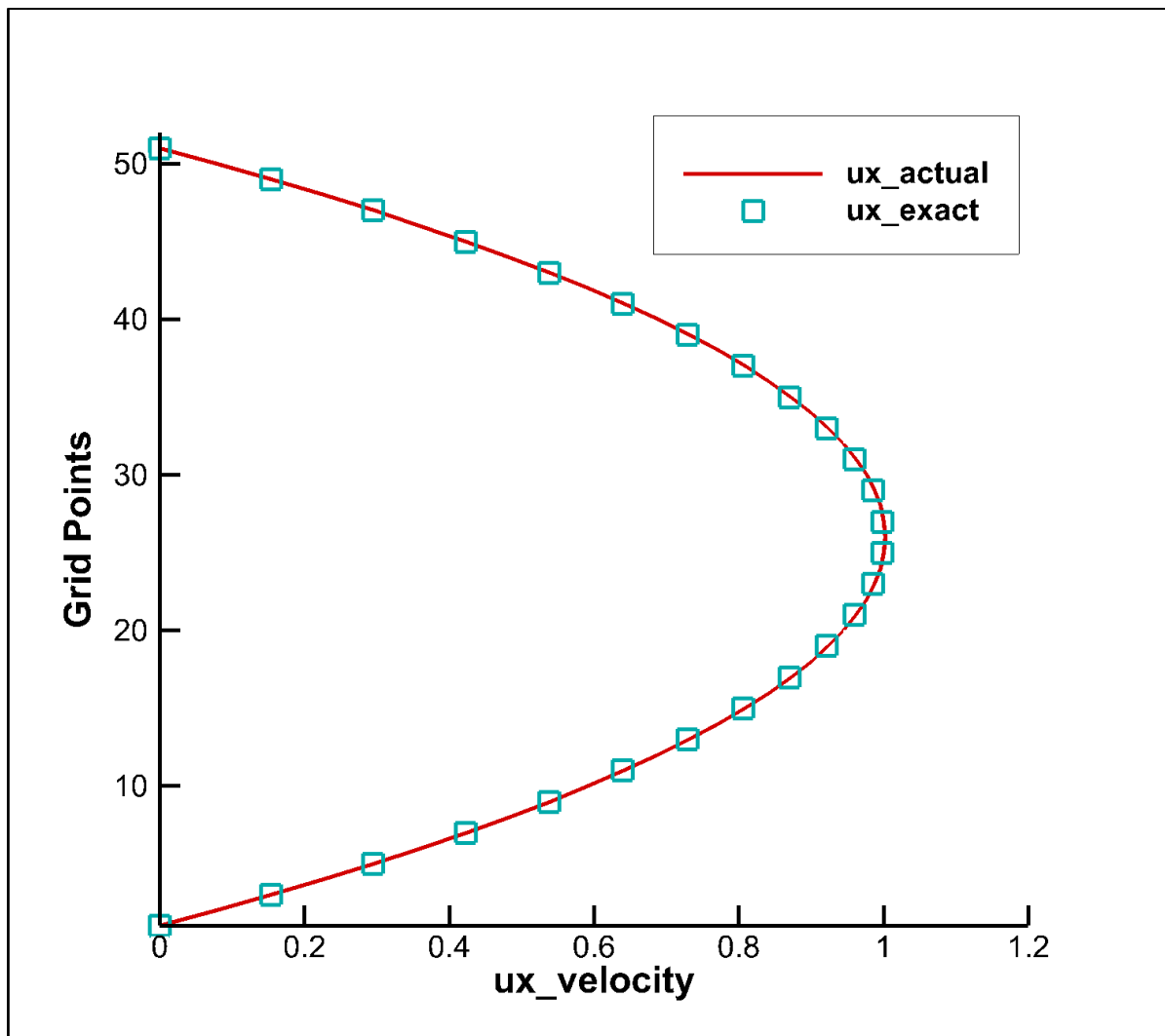   Grid points in x direction:30
   Grid points in x-direction: 10*Ny

u_average	ux_exact	ux_actual	error	
0.666667	1	0.997201	0.280667%	umax_act=1.4958u_avg

4. Reynolds Number: 40
   Grid points in x direction:30
   Grid points in x-direction: 10*Ny

u_average	ux_exact	ux_actual	error	
0.666667	1	0.997201	0.280667%	umax_act=1.4958u_avg

5. Reynolds Number: 20
   Grid points in x direction:50
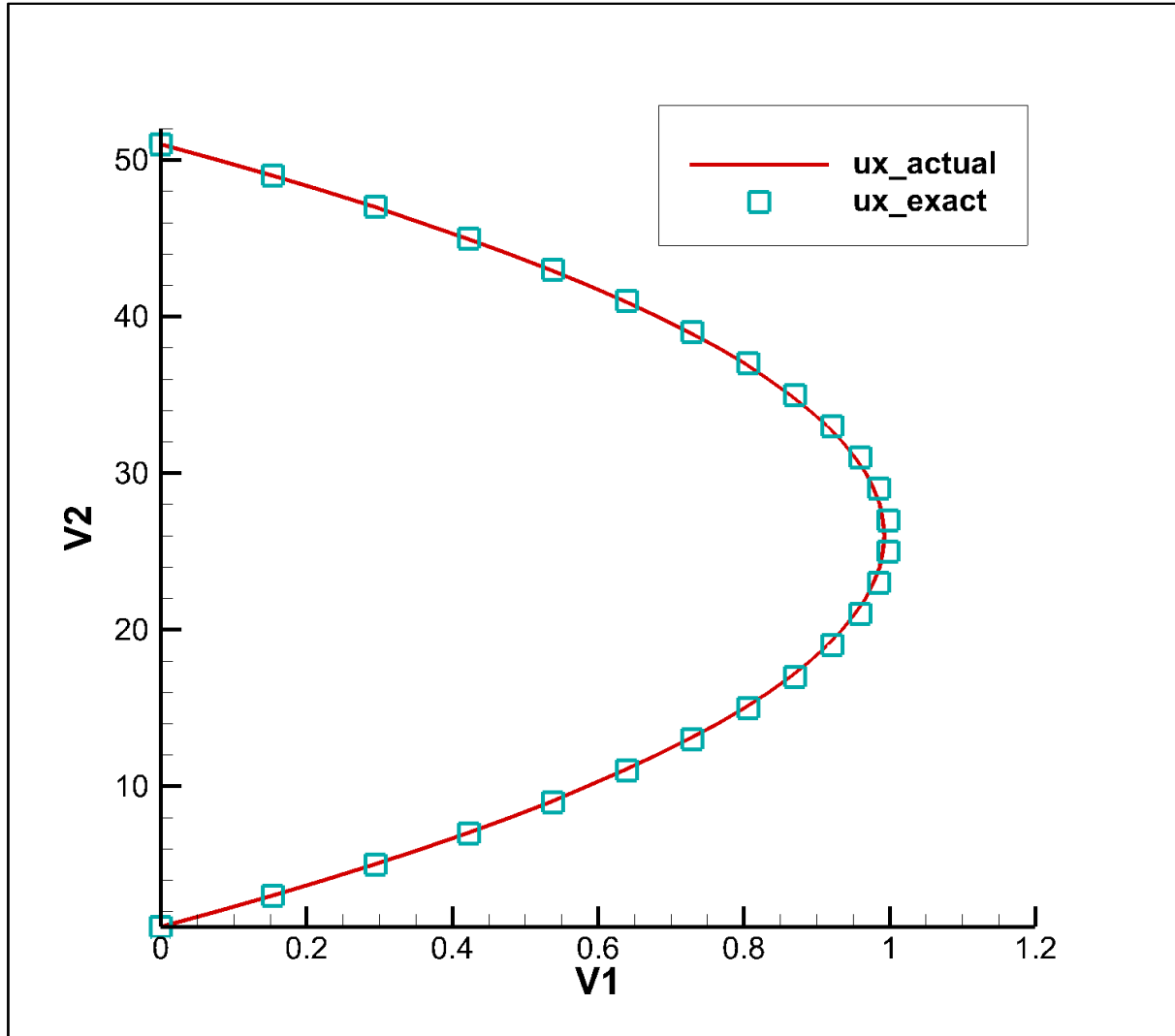   Grid points in x-direction: 10*Ny

u_average	ux_exact	ux_actual	error	
0.666667	1	0.994582	0.544759%	umax_act=1.49187u_avg

6. Reynolds Number: 20
    Grid points in x direction:50
    Grid points in x-direction: 10*Ny

u_average	ux_exact	ux_actual	error	
0.666667	1	0.992416	0.764197%	umax_act=1.48862u_avg