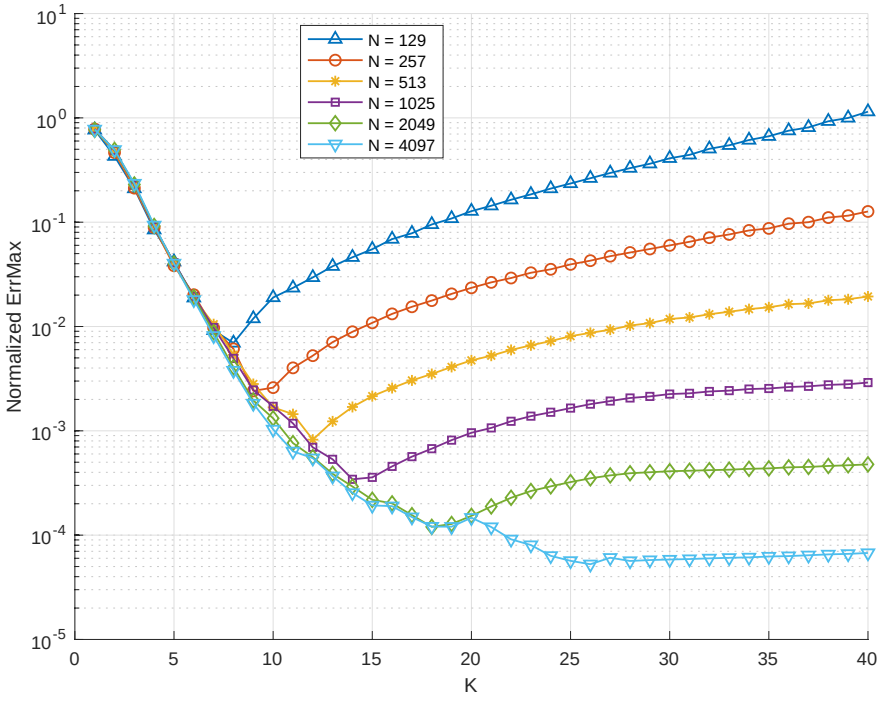
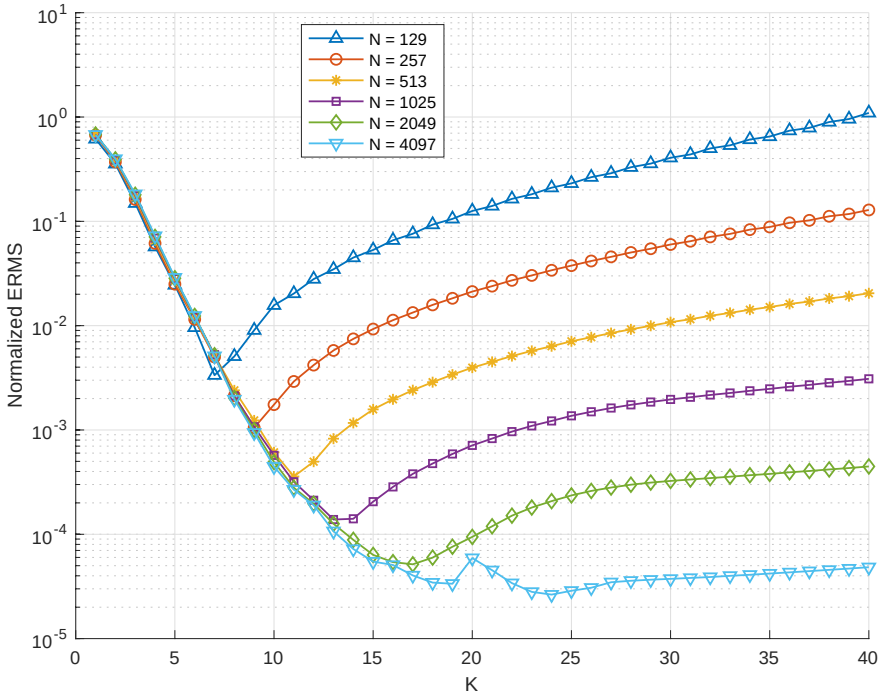
Dependence on K — Example 1



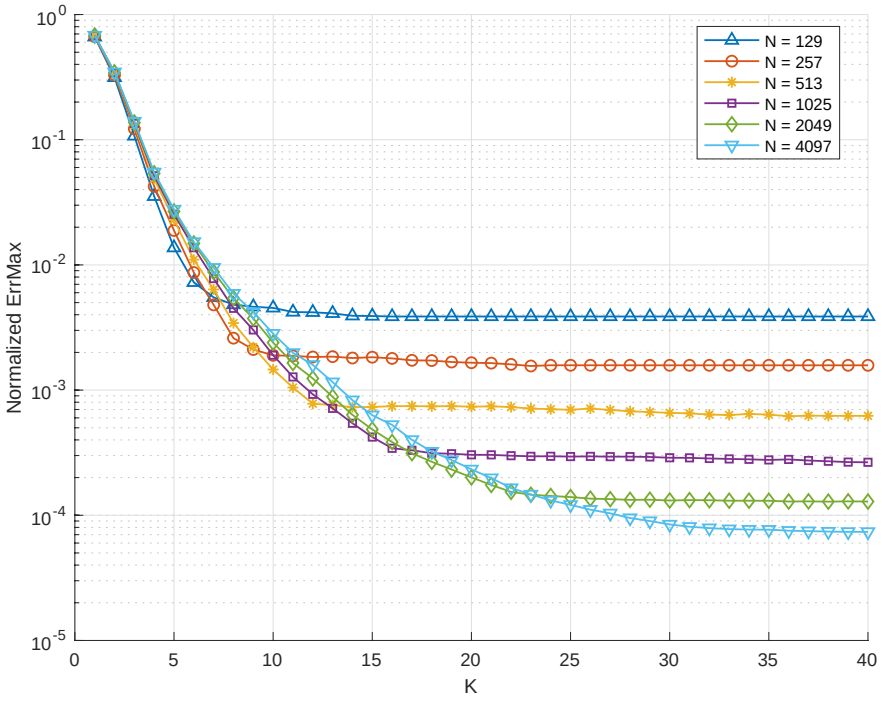
(a)



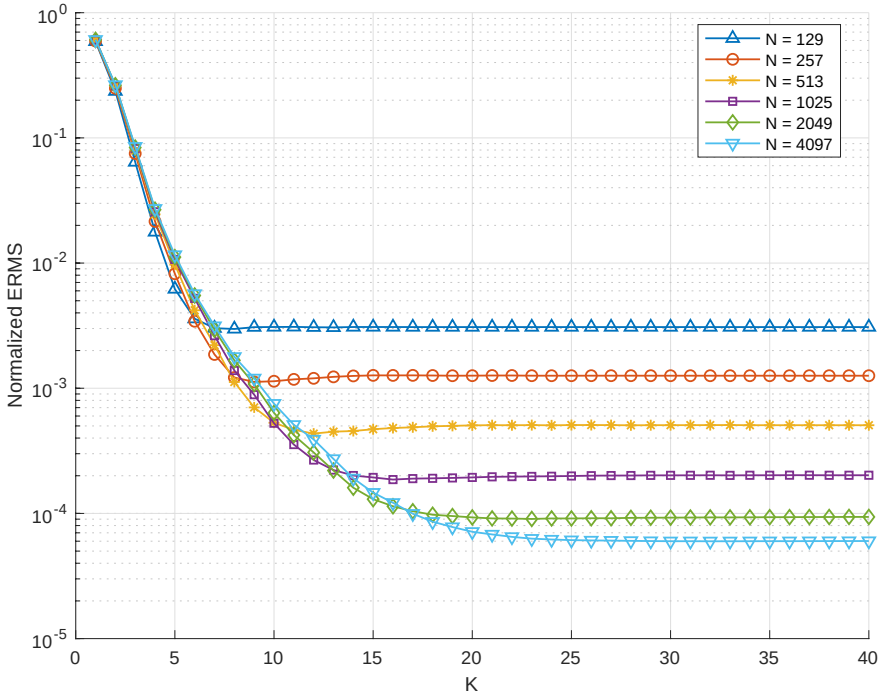
(b)

Figure 1: (a): The normalized maximum absolute error versus the update parameter K. (b): The normalized RMS error versus K. Both for Example 1: `chfield = 'd'`, `fac = 10`.

Dependence on K — Example 2



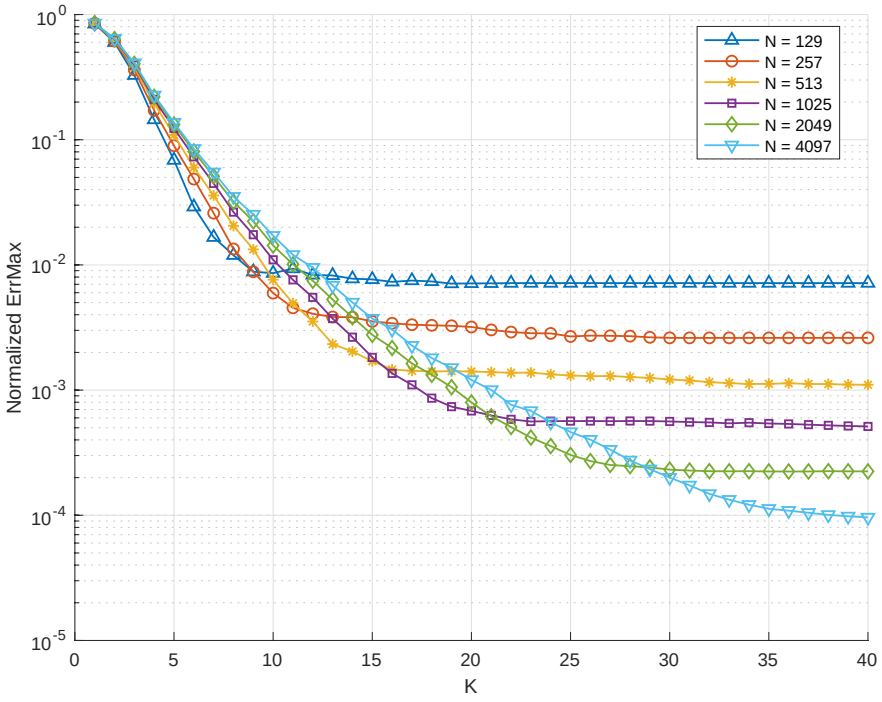
(a)



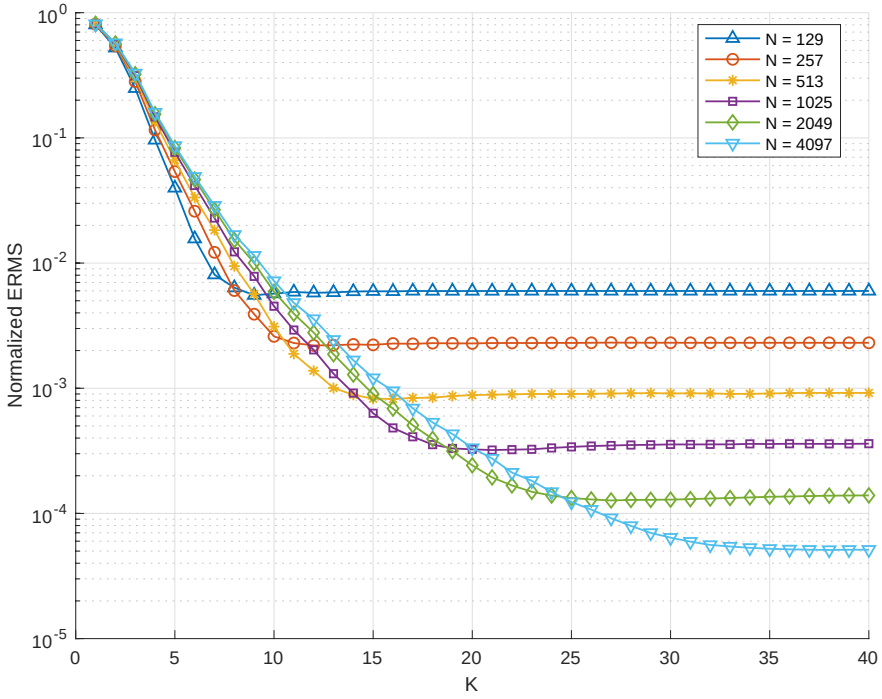
(b)

Figure 2: (a): The normalized maximum absolute error versus the update parameter K. (b): The normalized RMS error versus K. Both for Example 2: `chfield = 'y'`, `fac = 4`.

Dependence on K — Example 3



(a)



(b)

Figure 3: (a): The normalized maximum absolute error versus the update parameter K. (b): The normalized RMS error versus K. Both for Example 3: `chfield = 'y'`, `fac = 10`.

A guideline for choosing K

For an $N \times N$ mesh where $N = 2^p + 1, p = 7, 8, 9, 10, 11, 12$, a guideline for choosing the update factor K in each of the 3 examples above is given in the tables below.

- **Example 1**: `chfield = 'd', fac = 10`

N	129	257	513	1025	2049	4097
K	7	9	12	14	18	24

- **Example 2**: `chfield = 'y', fac = 4`

N	129	257	513	1025	2049	4097
K	7	9	12	16	22	28

- **Example 3**: `chfield = 'y', fac = 10`

N	129	257	513	1025	2049	4097
K	9	11	14	18	23	28

Overall, a **general** guideline for choosing the update factor K for **nonlinear** vector fields is given in the table below.

N	129	257	513	1025	2049	4097
K	8	10	13	16	21	26

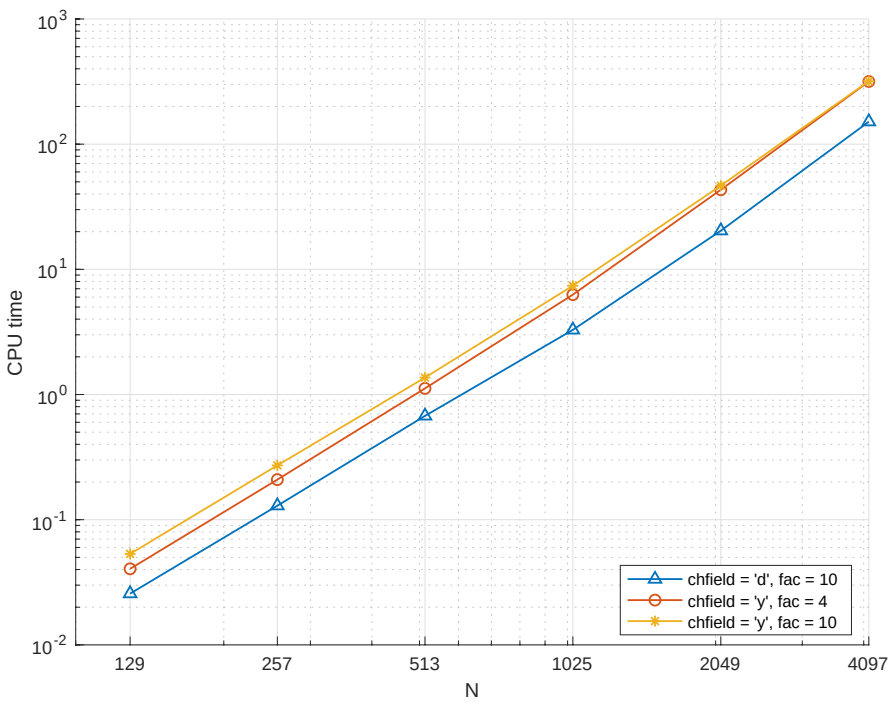
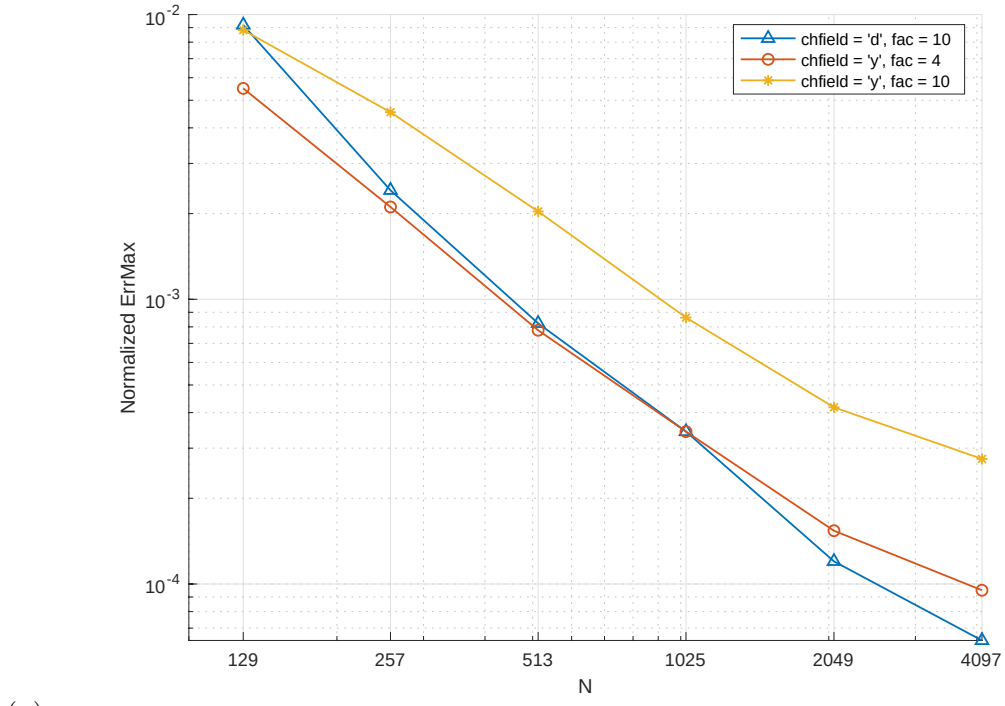
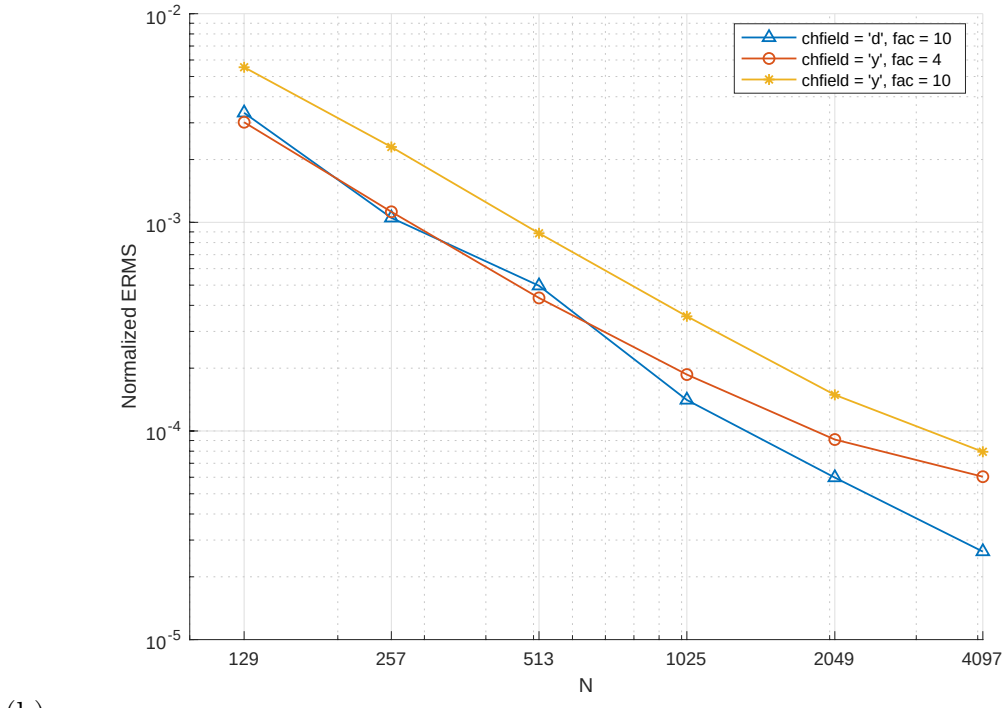


Figure 4: The CPU time versus mesh size N, for Examples 1-3 with optimal choice of K.



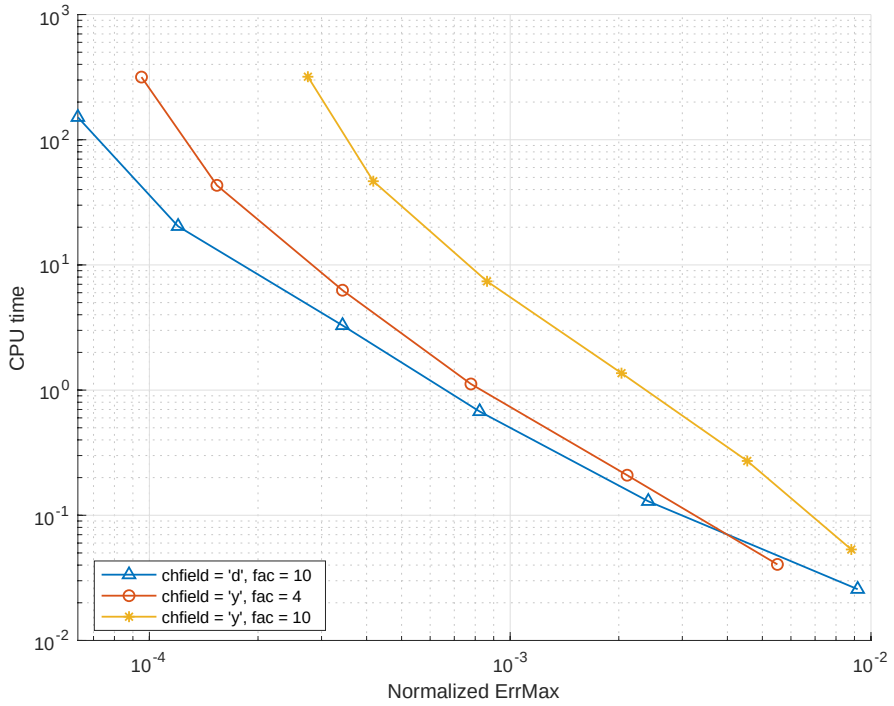
(a)



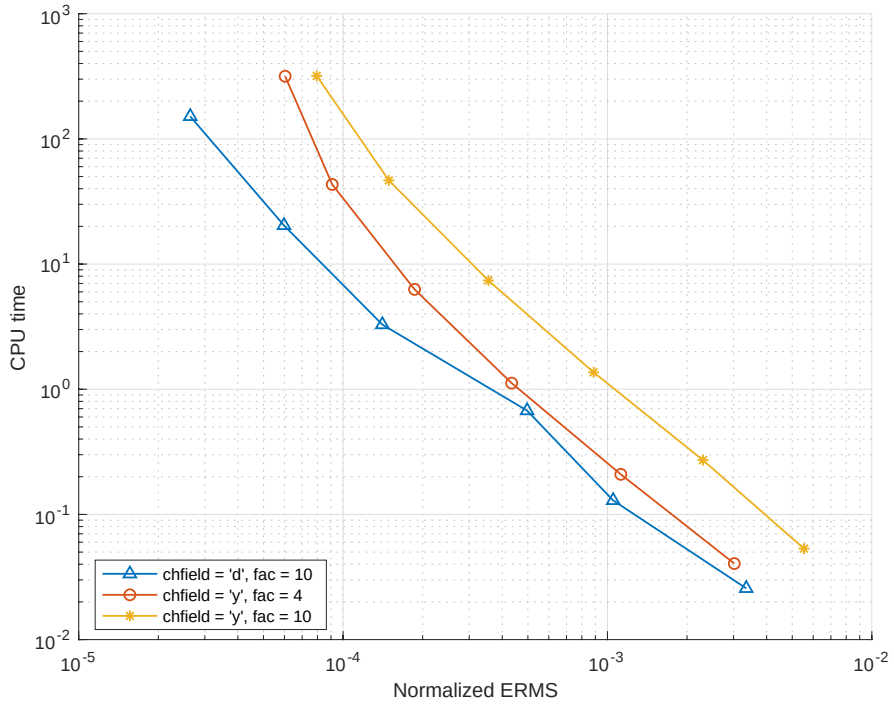
(b)

Figure 5: (a): The normalized maximum absolute error versus the mesh size N.
(b): The normalized RMS error versus N. Both for Examples 1-3 with optimal choice of K.

CPU time versus normalized errors with optimal K



(a)



(b)

Figure 6: (a): The CPU time versus the normalized maximum absolute error. (b): The CPU time versus the normalized RMS error. Both for Examples 1-3 with optimal choice of K.