Double Precision vs Single Precision

Streamwbise velocity is stored in single precision and double precision respectively.

First and second derivatives are computed using 4th, 6th or 8th finite different scheme (FD4 / FD6 / FD8), where could be , , etc.

The values with single precision are denoted with subscription “*s*”, while the values with double precision are denoted with subscription “*d*” (e.g. and )

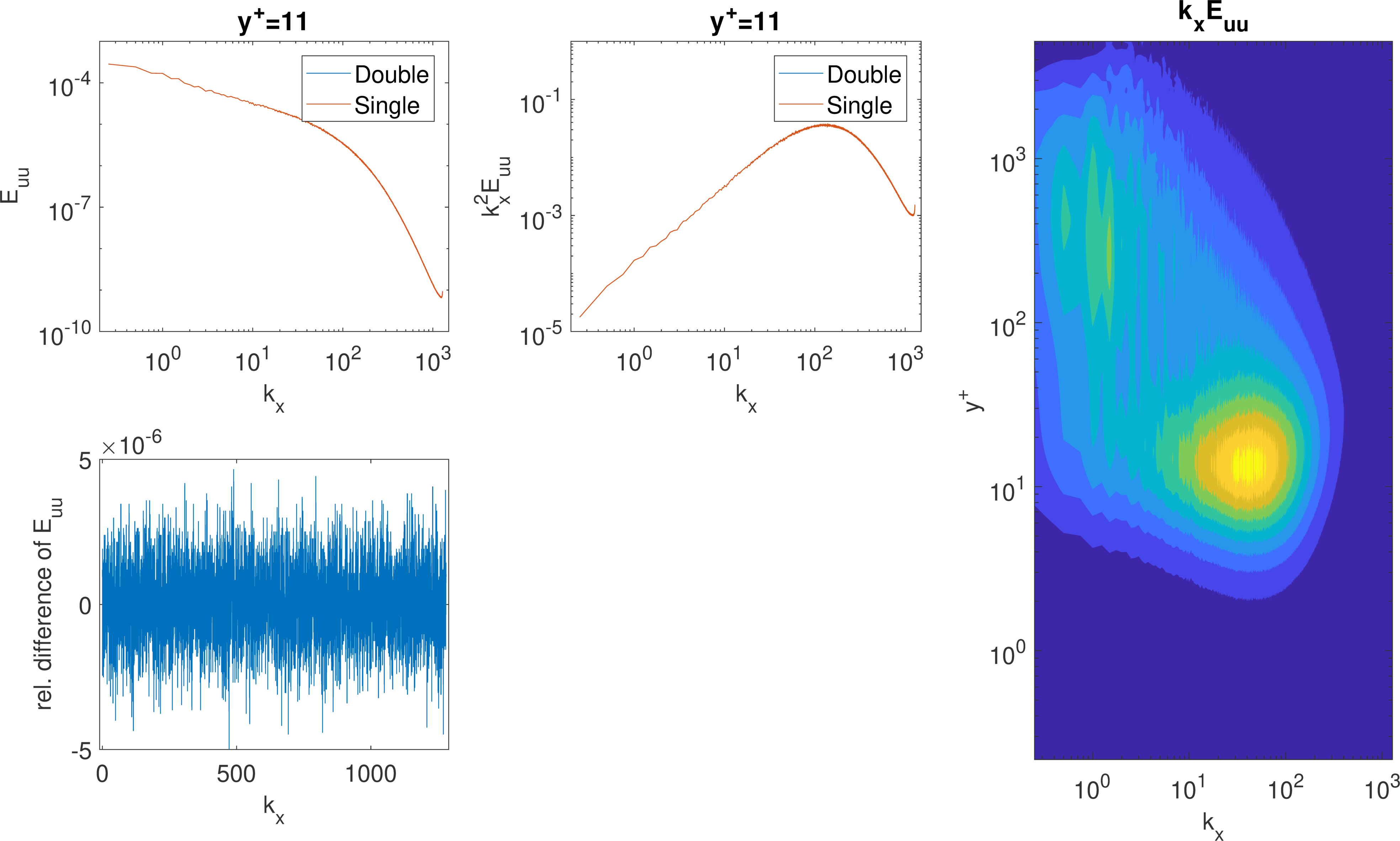
*b*

Figure 1. (Left) relative error of (**Streamwise** direction). (Top right) relative error of at (). (Bottom right) relative error of at ().

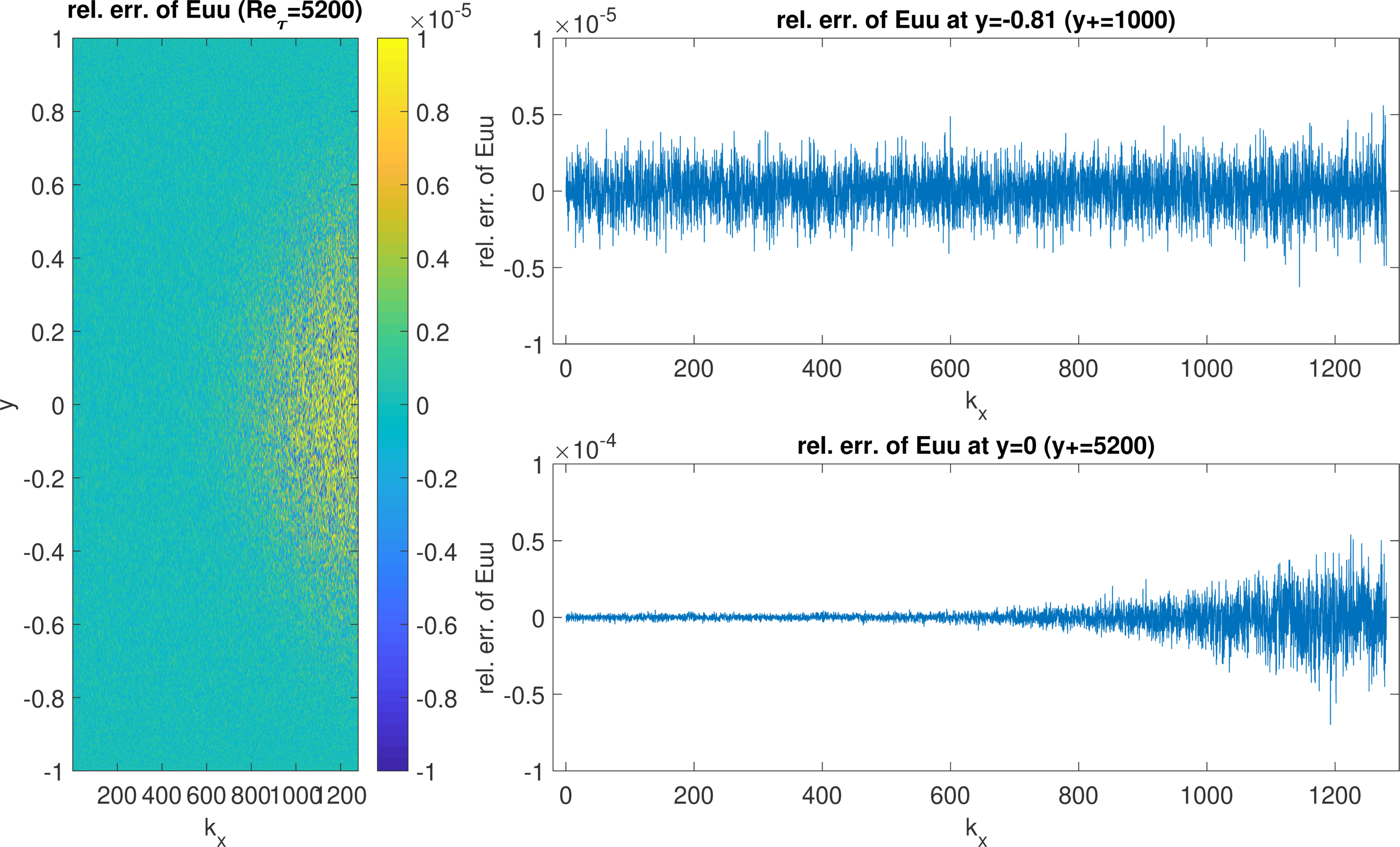


Figure 2. (Left) relative error of (**Spanwise** direction). (Top right) relative error of at (). (Bottom right) relative error of at ().

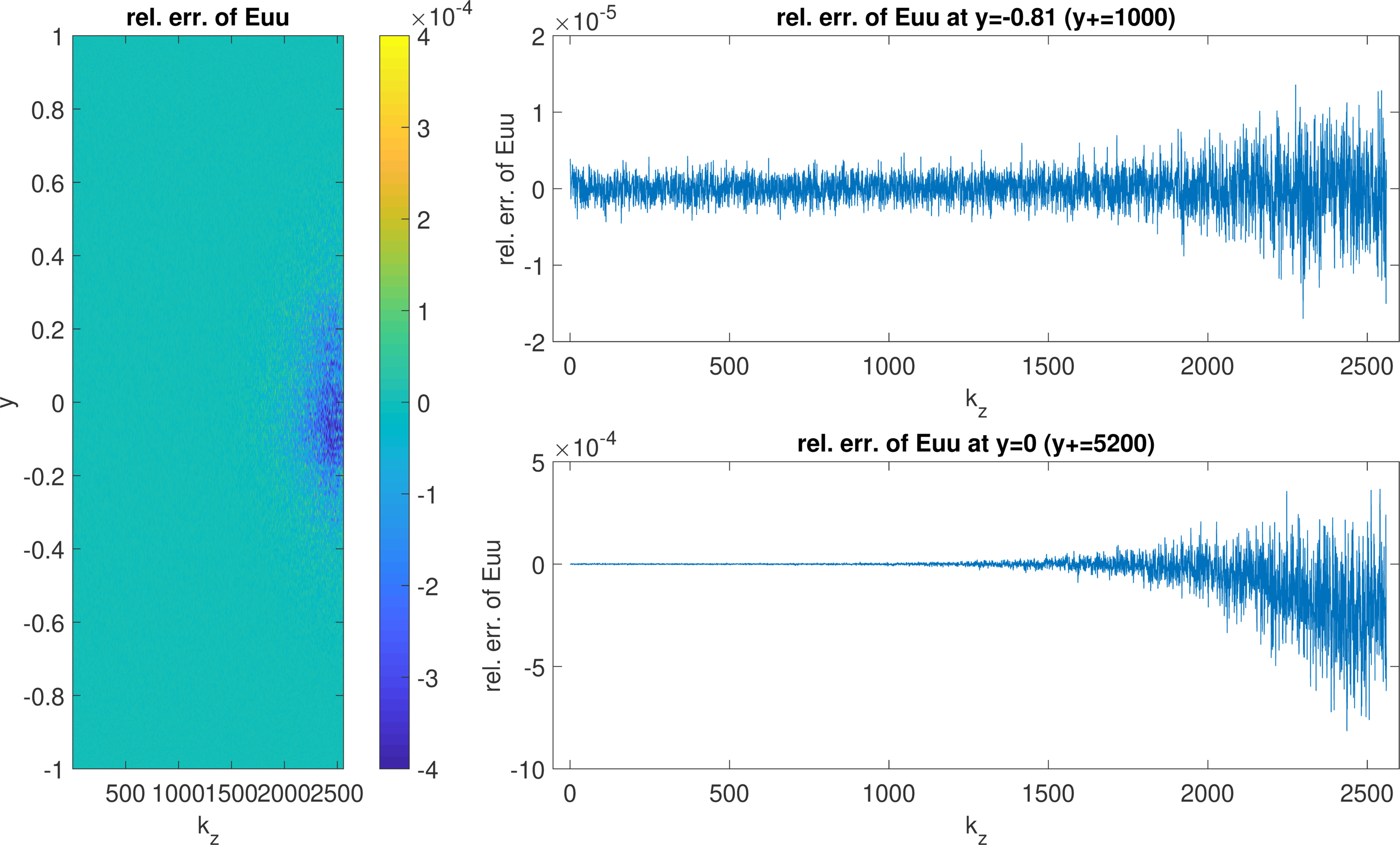


Figure 3*.* **Maximum error** of first and second derivatives at different wall-normal height.Maximum error is the maximum of over a wall-parallel plane. The error is a function of .5000 points are randomly selected.

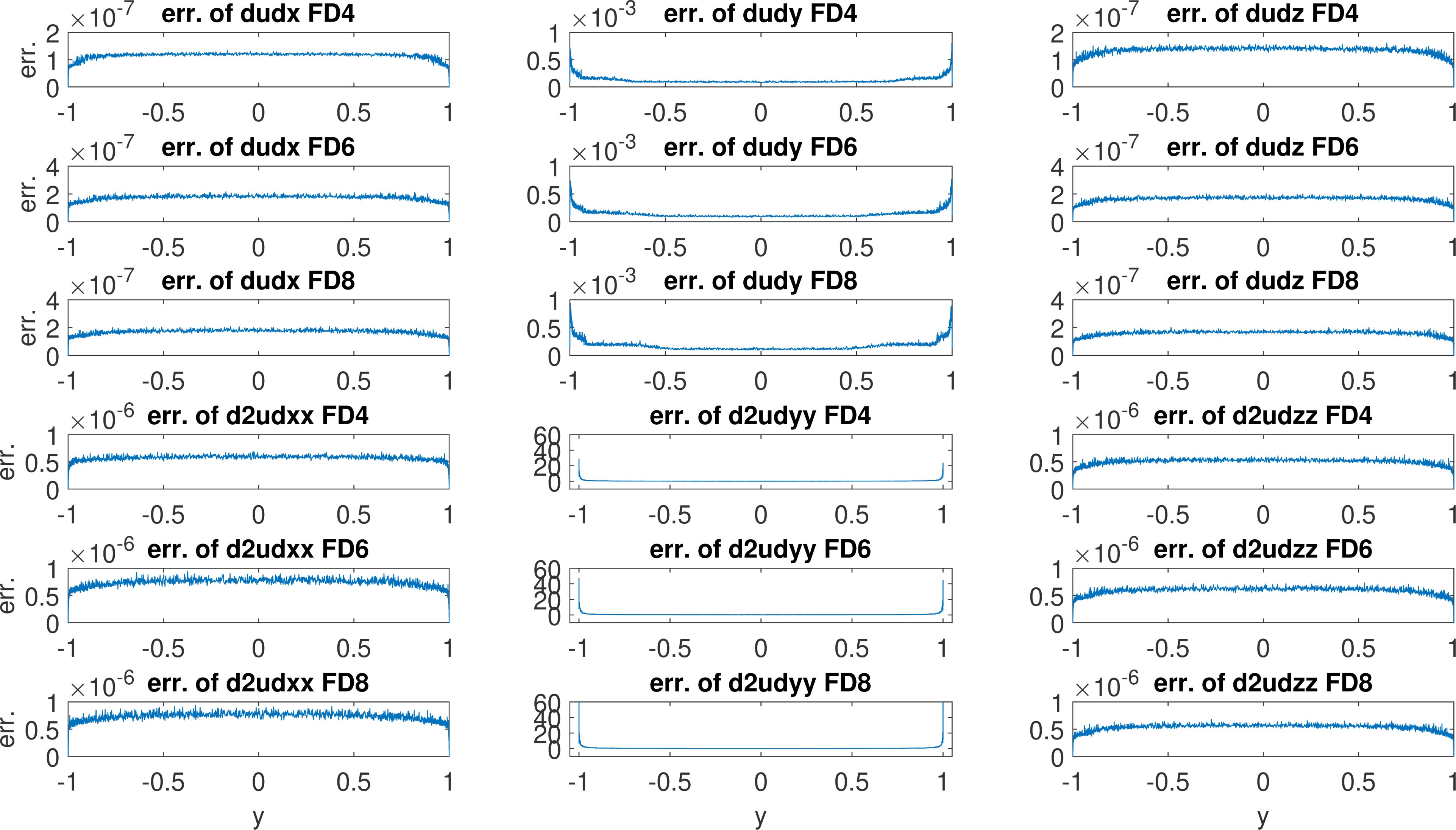


Figure 4*.* **Maximum relativeerror** of first and second derivatives at different wall-normal height. Maximum relative error , where is the average of over a wall-parallel plane. The relative error is a function of .5000 points are randomly selected.

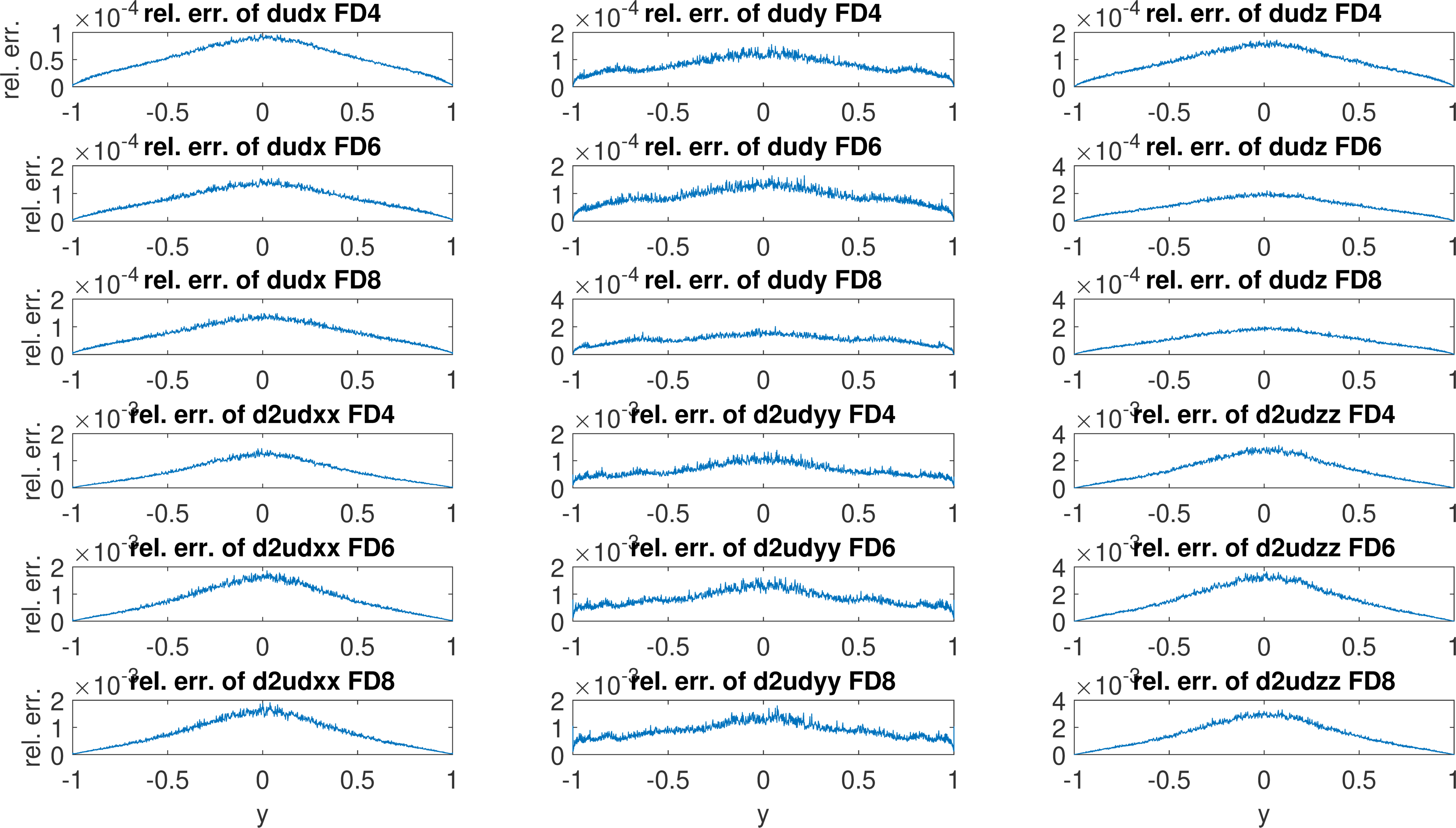


Figure 5*.* **RMS of error** of the continuity condition at different wall-normal height. Let , and , where is the average over a wall-parallel plane. The RMS of error is defined as , and thus is a function of . (Top row) , RMS of error calculated using double precision. (Middle row) , RMS of error calculated using single precision. (Bottom row) . 5000 points are randomly selected.

