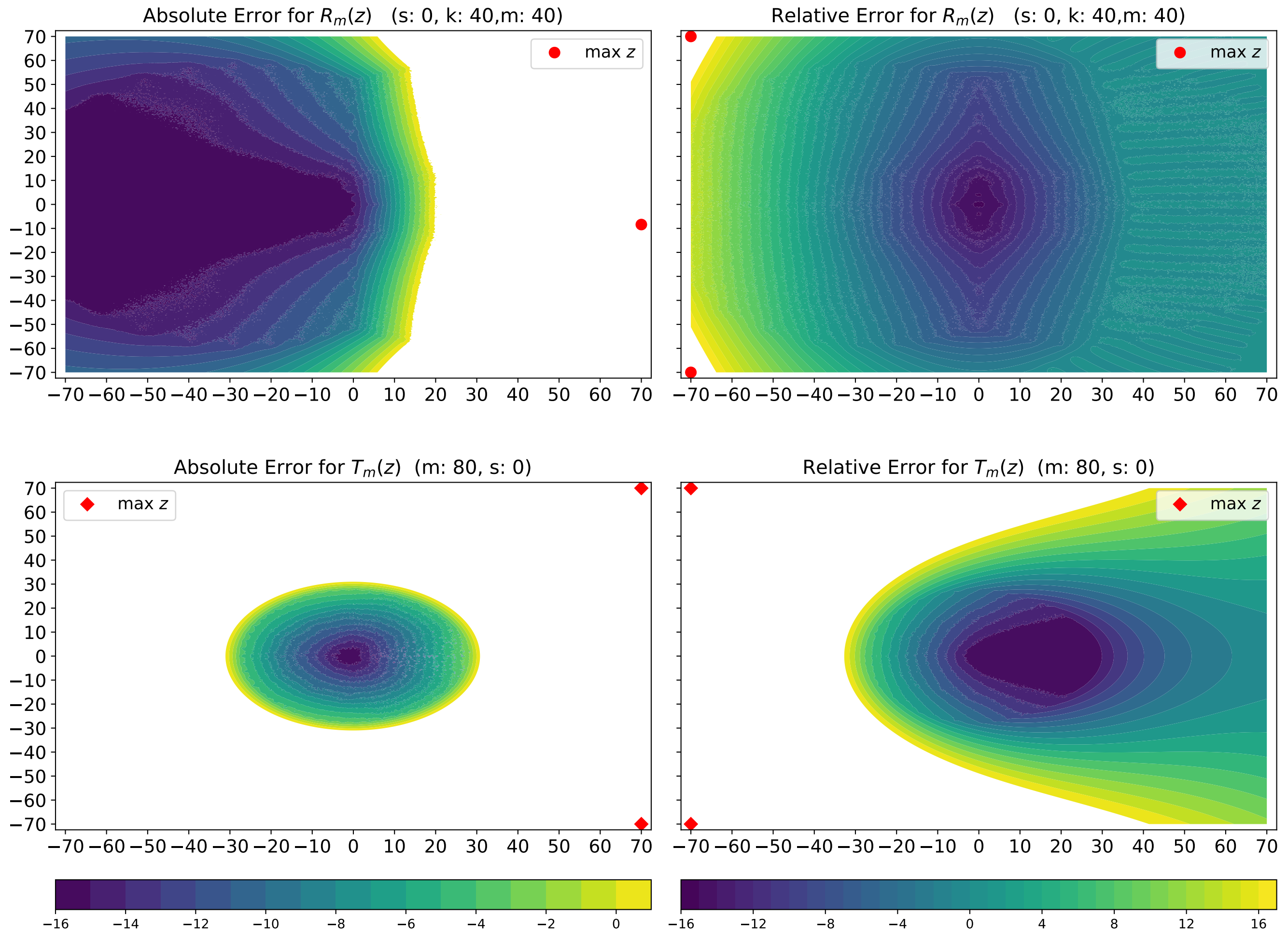


The contour plot shows the error of approximating  $\exp(x)$  with a plain Taylor  $T_m(z)$  and plain Padé polynomial  $R_{k,m}(z)$  with the polynomial degree of  $m$  and  $(m+k)$  respectively over the domain  $[-70,70]$ .



Note: both plain Taylor and Pade have the same polynomial degree of 80 but it looks like Pade does suprisingly well for in both absolute and relative case. In terms of the maximum errors, both Taylor and Pade have them at the exact same spots (  $\text{Re}(z)=70$  and  $\text{Re}(z)=-70$  for absolute and relative respectively). In relative error, Pade seems to do really well to approximate exponential function when  $\text{Re}(z)<0$ , which we always had trouble in Taylor approximation.