Mathematik in der Wissenschaft des Himmels

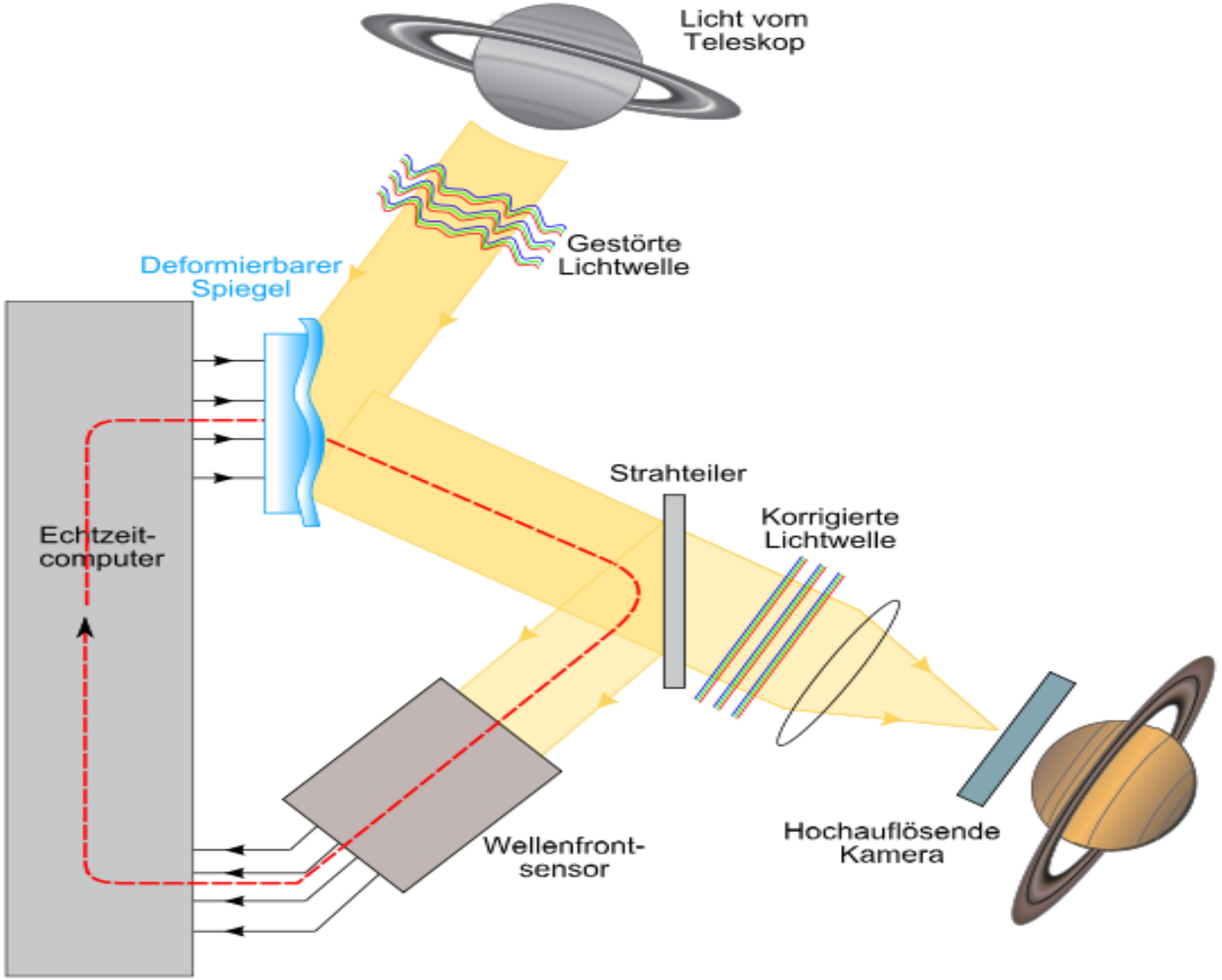
Referent: Sergiy Pereverzyev

Teilnehmer: Berger, Küsel, La Marca, Lugmayr
Maier, Stockinger, Weichselbaum, Ziegler

The European Extremely Large Telescope

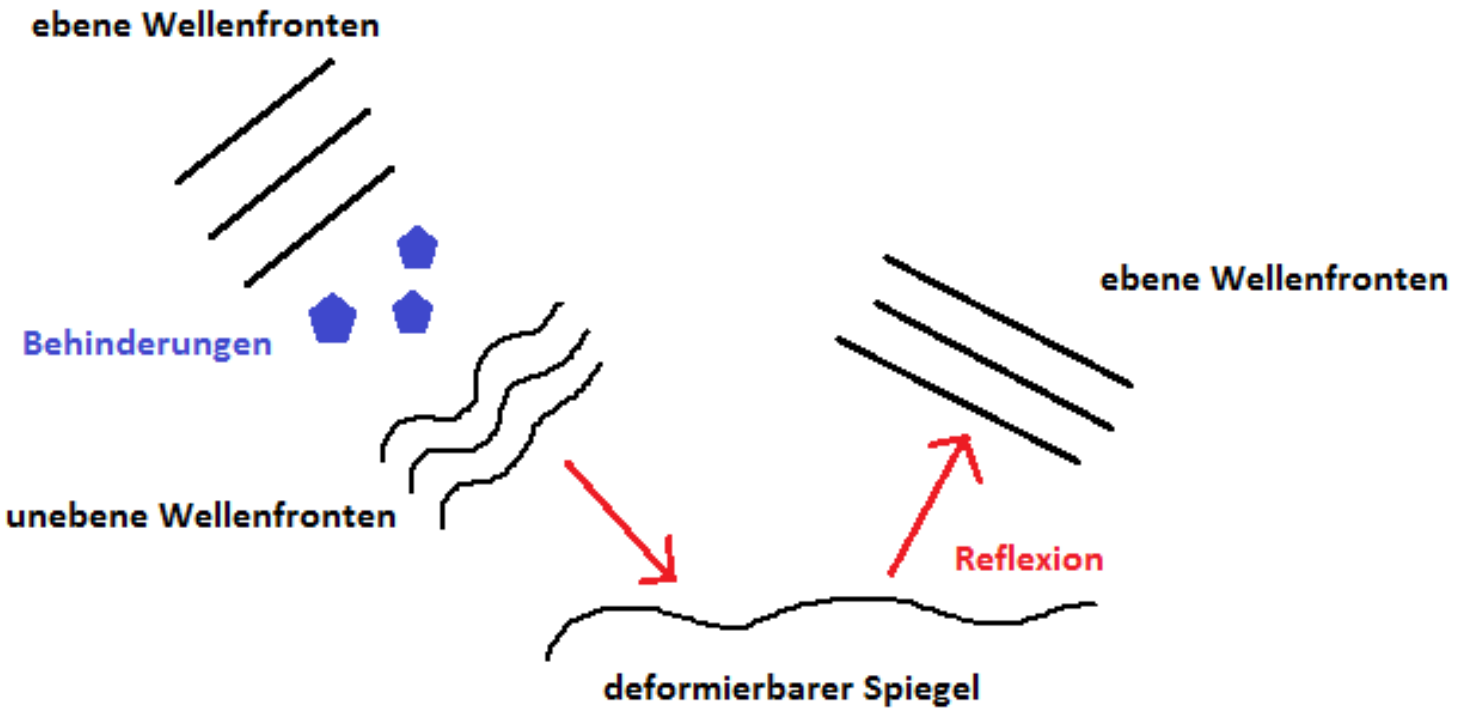
Kosten von 1,1 Milliarden Euro
Spiegel mit 40m Durchmesser
Fertigstellung 2018

Adaptive Optik



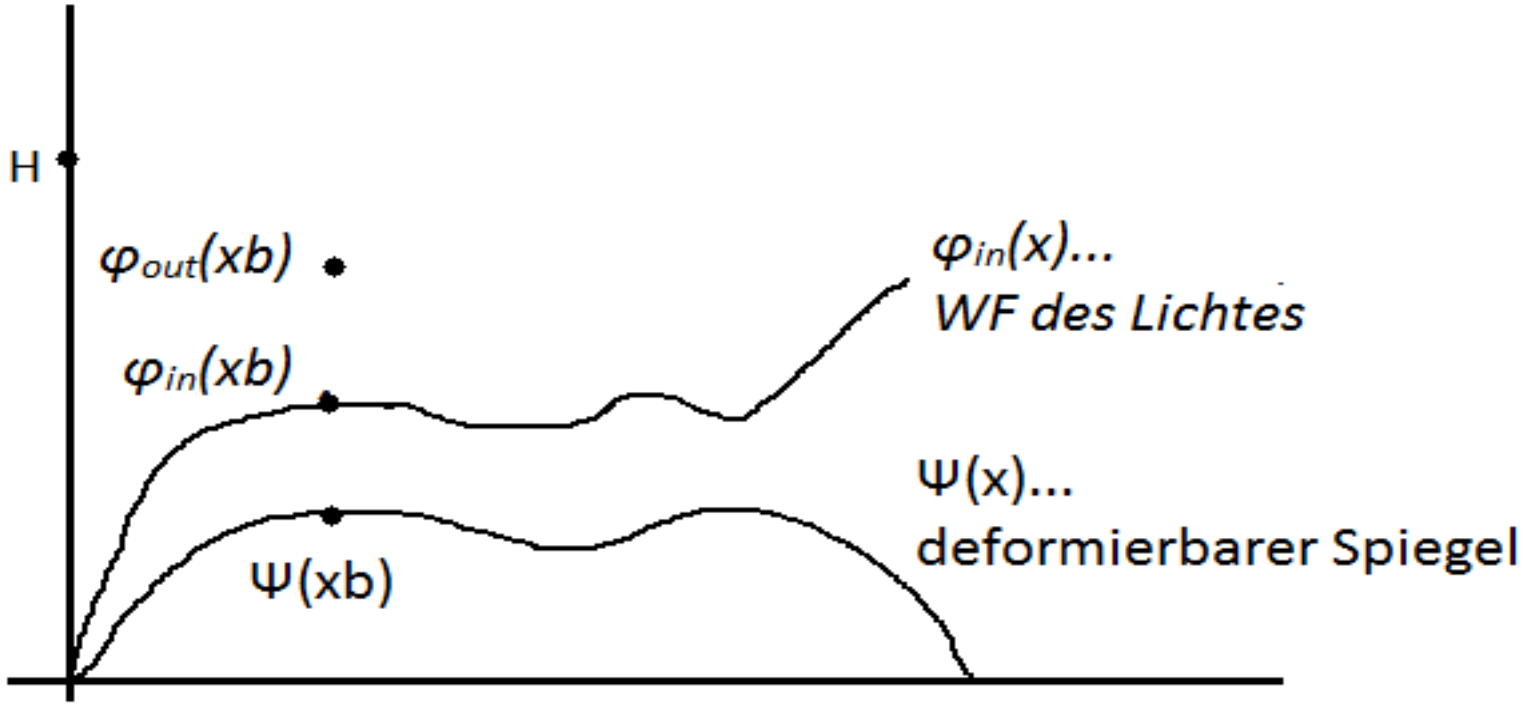
Deformierbarer Spiegel

- Reflexion → ebene Wellenfronten → scharfes Bild



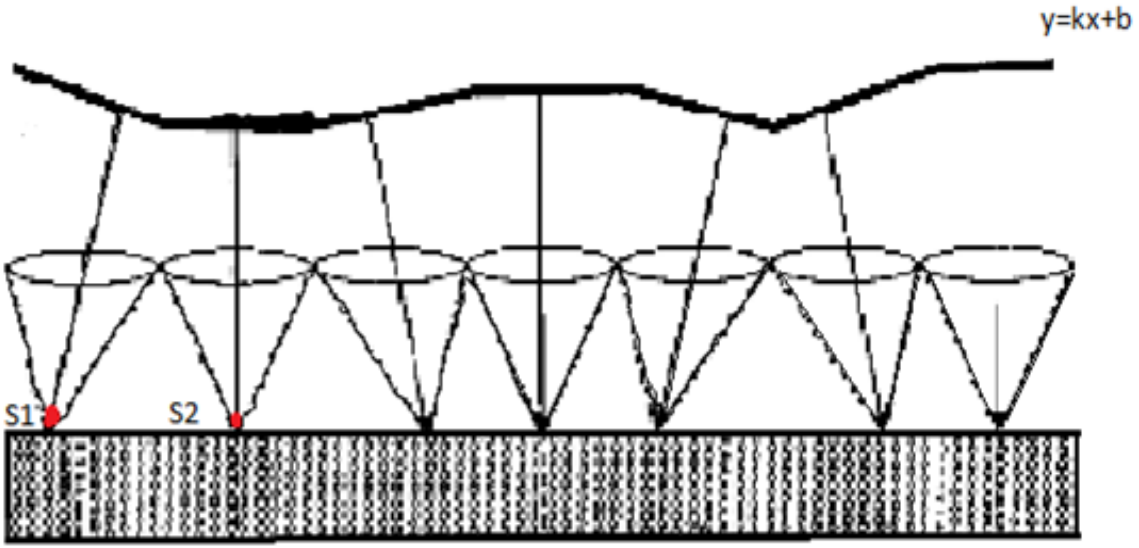
Deformierbarer Spiegel

- $\varphi_{in}(x)$-Ψ(x)+ $\varphi_{out}(x)$- Ψ(x)=H
- $\varphi_{out}(x)=2$ Ψ(x)- $\varphi_{in}(x)+H$
- $\varphi_{out}(x)=H \rightarrow$ Ψ(x)= $\varphi_{in}(x)/2$



Messungsrauschen

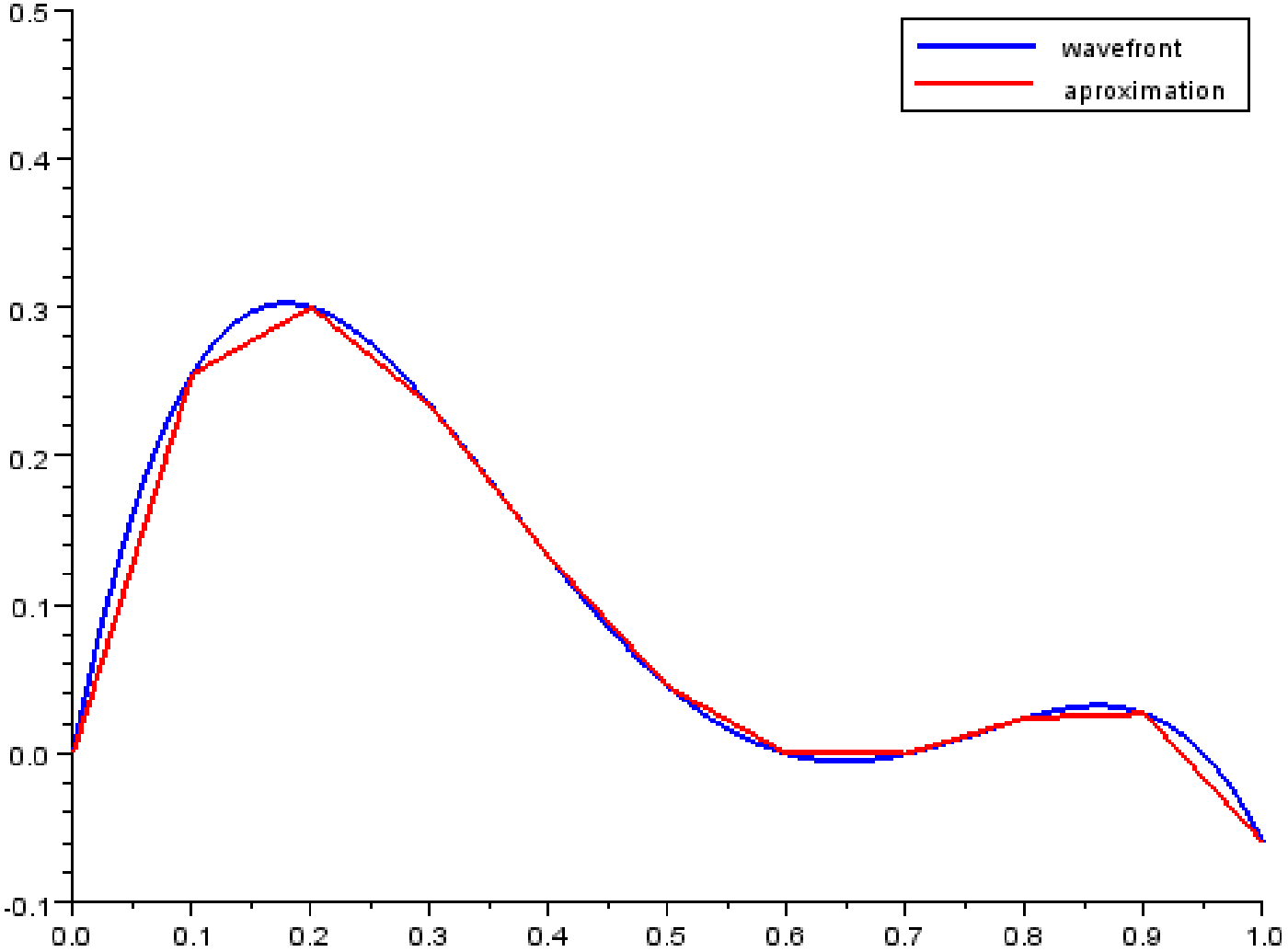
s=k*c



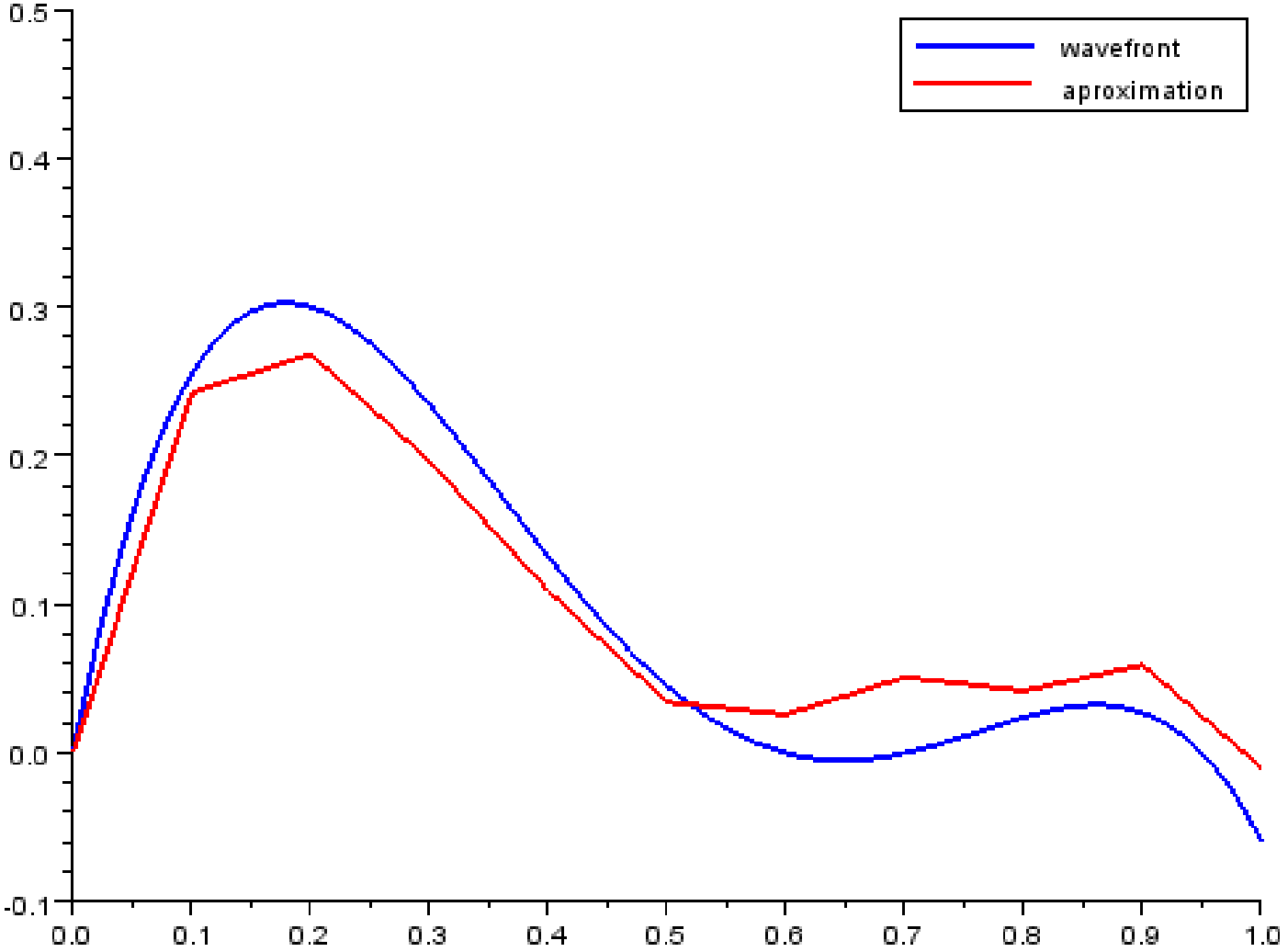
se=c*k+ e/d

e...Zufälliger Wert in [-emax,emax]

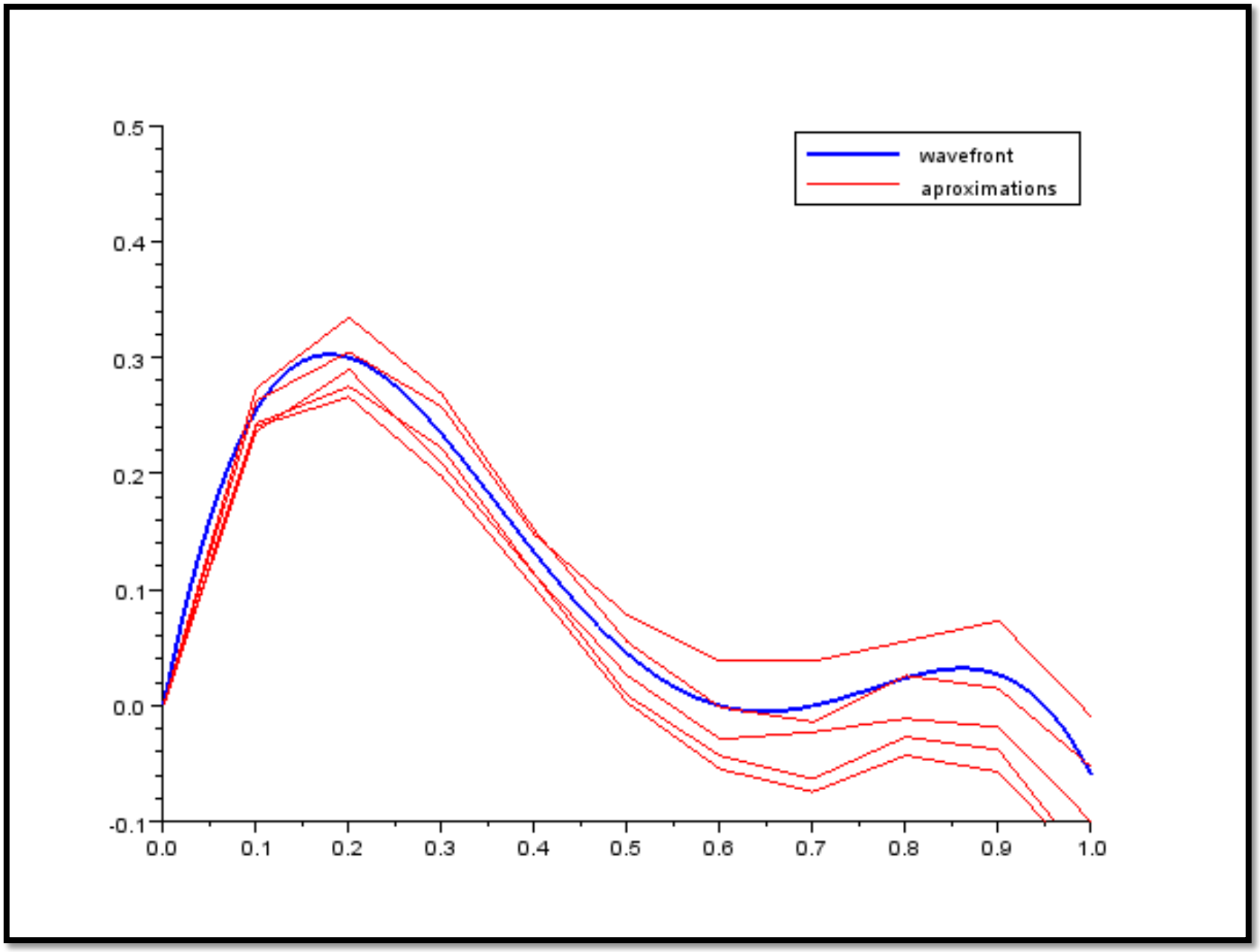
Approximation ohne Rauschen



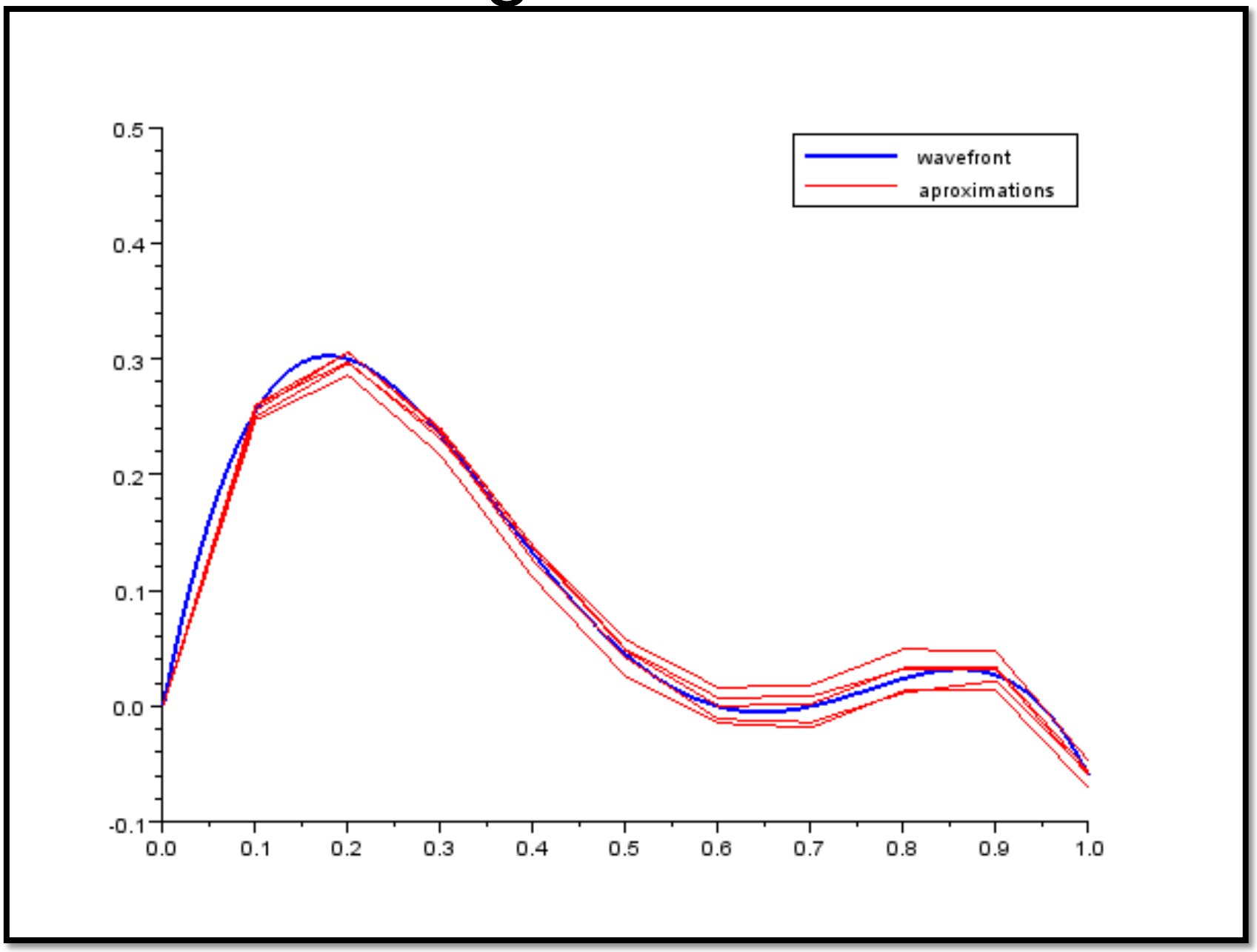
Approximation mit Rauschen



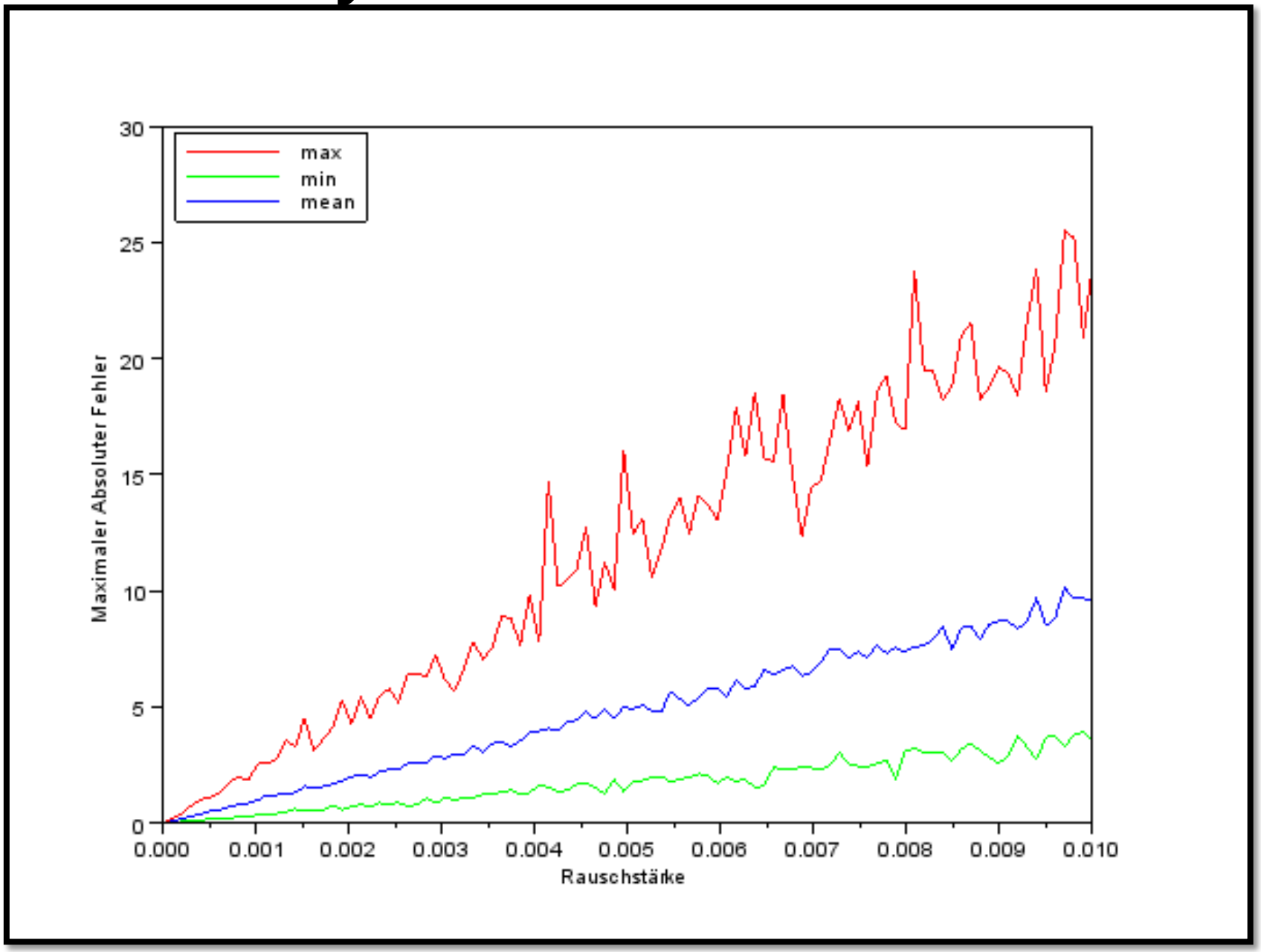
viel Rauschen



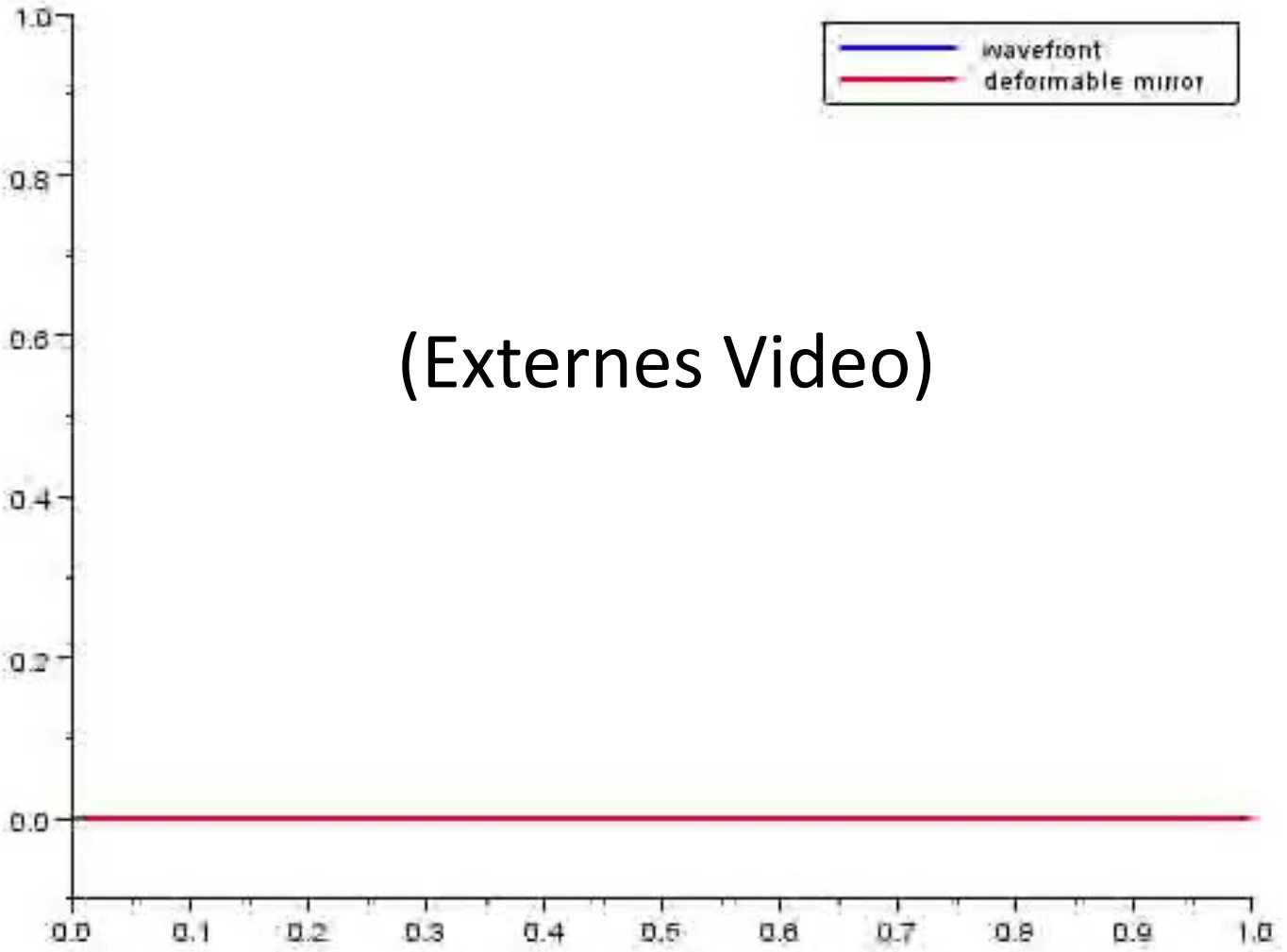
wenig Rauschen



Analyse des Rauschens

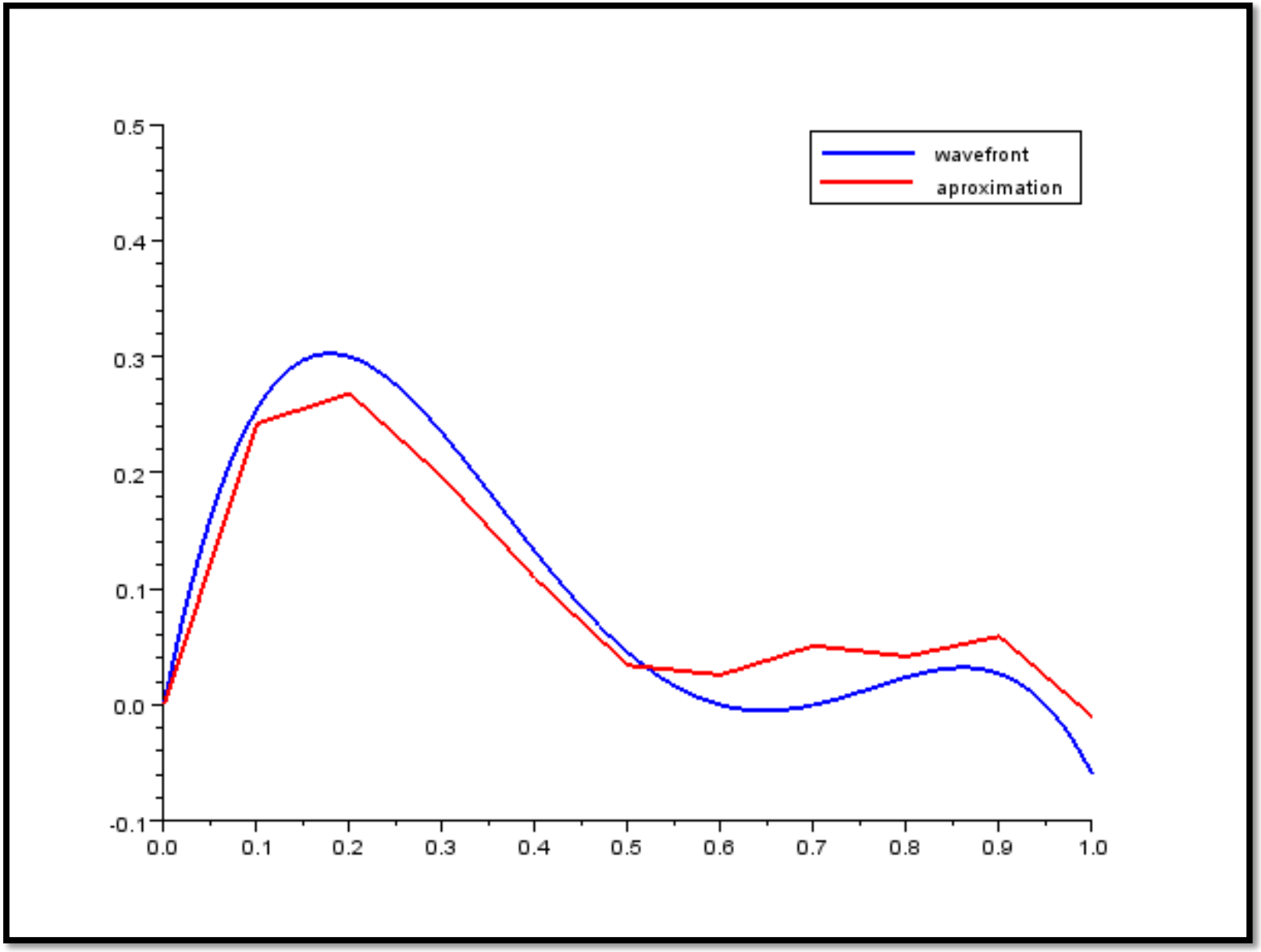


ohne Adaptive Optik

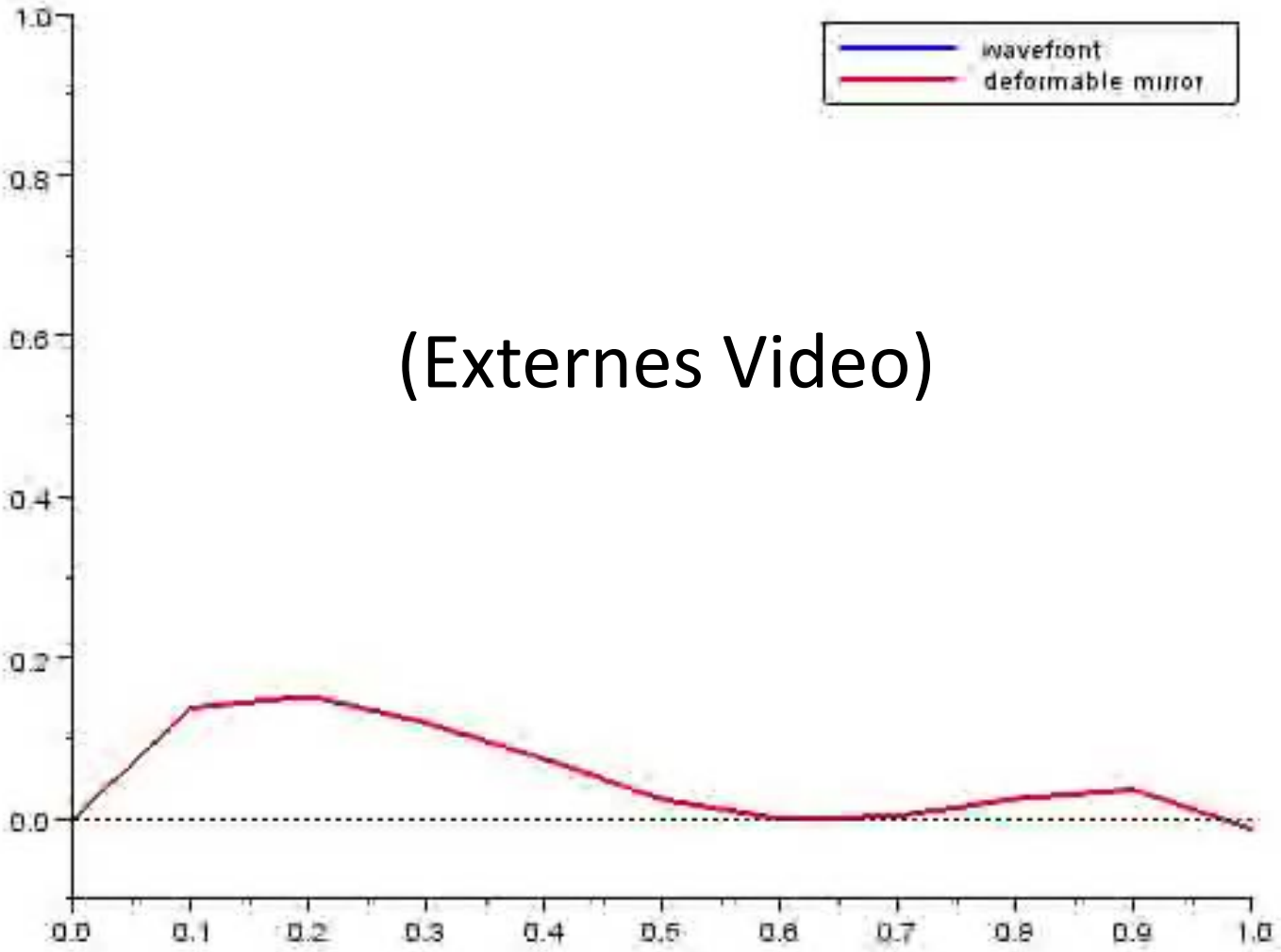


(Externes Video)

Aproximation von φin



mit Adaptiver Optik



(Externes Video)

Ergebnis