# Study on convergence properties of econometric processes

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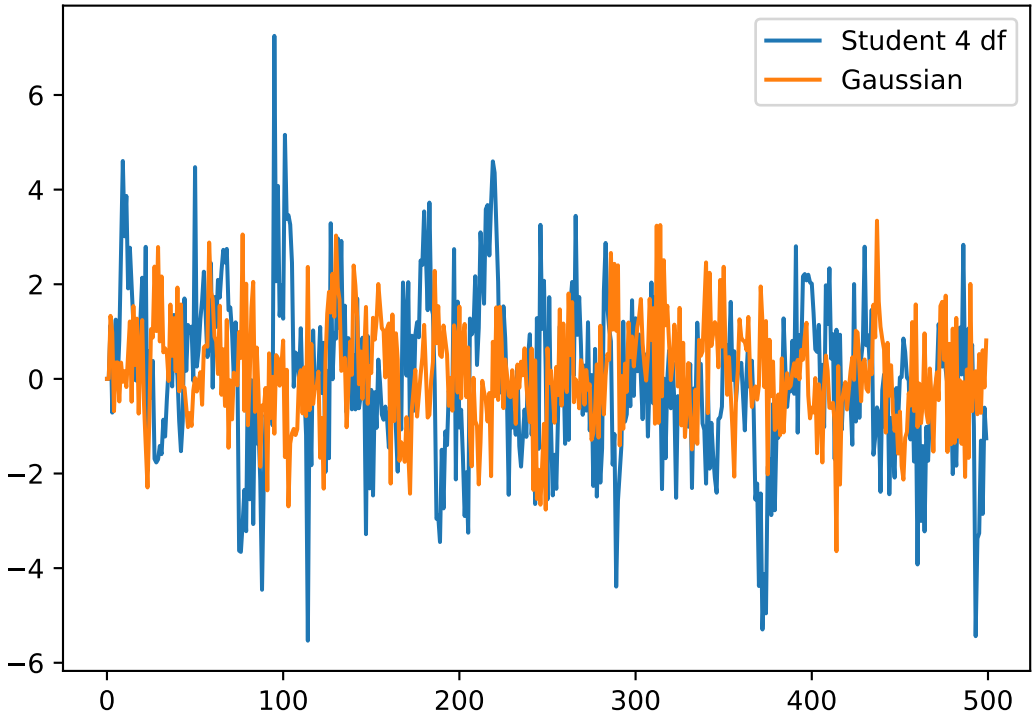
### Convergence of AR coefficients

For replicability purposed, unless stated otherwise the simulations have been carried out with a fixed seed $s = 10$.

Below we compare a Gaussian and Student t process.




The two processes are AR(2) with $\phi_1 = 0.2$ and $\phi_2 = 0.5$ As it can be clearly seen from the picture above, deviations in the Student process are much wider than the Gaussian. Let's compute the estimates via MLE

Below the estimated parameters for both the processes

```
##      fun: 860.5620593536484
##      jac: array([ 0.01051331, -0.01025391])
##  message: 'Optimization terminated successfully.'
##     nfev: 23
##      nit: 5
##     njev: 5
##   status: 0
```

```
##  success: True
##        x: array([0.2652752 , 0.46457358])
##      fun: 688.4905025877918
##      jac: array([0.00217438, 0.00051117])
##  message: 'Optimization terminated successfully.'
##     nfev: 23
##      nit: 5
##     njev: 5
##   status: 0
##  success: True
##        x: array([0.12597001, 0.48442209])
```

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Finally, we run some convergence tests, below the plot with deviation from the true parameter

#{r, echo = FALSE} #htmltools::includeHTML("/home/snake91/git/ShareCode/stats/mle/rmdecon/plot.html")
#