

## Lecture 4

Filip and Pontius SVD results both before and after model updating.

```
Threshold for all below = 0

Estimated Filip 10 degree polynomial using SVD Vector 11D:
-1479.64 -2794.89 -2335.23 -1137.13 -357.359 -75.7383 -10.9652 -1.07113 -0.0675932 -0.0024895 -4.06612e-05
Filip residual standard deviation: 0.00367067 - Compared to random fit error: 0.930513
Filip standard deviation of estimated model parameters a: Vector 11D:
89743.5 168526 140432 68396.8 21567.9 4602.49 673.335 66.7101 4.28517 0.161221 0.00269886
This STD of model parameters is too big, try with model updating.

Estimated Pontius polynomial using SVD Vector 3D:
0.00067356 7.32059e-07 -3.16081e-15
Pontius residual standard deviation: 0.000151455 - Compared to random fit error: 0.961769
Pontius standard deviation of estimated model parameters a: Vector 3D:
0.526068 7.69175e-07 2.37191e-13
This STD of model parameters is too big, try with model updating.

Filip dataset with stated std accounted for.
Estimated model parameters with std accounted for: Vector 11D:
-1463.99 -2765.53 -2310.72 -1125.14 -353.549 -74.9164 -10.8432 -1.05884 -0.0667877 -0.0024585 -4.01293e-05
Filip residual standard deviation: 0.00366381 - Compared to random fit error: 0.930513
Filip standard deviation of estimated model parameters a: Vector 11D:
292.026 548.379 456.962 222.564 70.1831 14.9769 2.1911 0.217082 0.0139444 0.000524622 8.78209e-06
This STD of model parameters is closer to stated values.

Pontius dataset with stated std accounted for.
Estimated model parameters with std accounted for: Vector 3D:
0.000673579 7.32059e-07 -3.16083e-15
Pontius residual standard deviation: 0.000151454 - Compared to random fit error: 0.961769
Pontius standard deviation of estimated model parameters a: Vector 3D:
0.000107847 1.57681e-10 4.86222e-17
This STD of model parameters is closer to stated values.
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Error estimation on Pontius after LU decomposition using Eq. 15.4.15.

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Pontius data parameters for 2nd degree polynomial using LU:   Vector 3D:
  0.000673566   7.32059e-07   -3.16082e-15
Error estimation of estimated parameters:   MatrixDiag 3x3:
  0.276754   5.91631e-13   5.62574e-26

Pontius data parameters for 2nd degree polynomial using Cholesky:   Vector 3D:
  0.000673566   7.32059e-07   -3.16082e-15

Filip parameters for 10th degree polynomial using LU:   Vector 11D:
  -62.682   -120.279   -96.8015   -43.106   -11.4683   -1.79618   -0.13739   0.00177994   0.00128404   9.84828e-05   2.57755e-06
Error estimation of estimated parameters:   MatrixDiag 11x11:
  4.91822e+08   1.24616e+09   5.7914e+08   8.27761e+07   4.15688e+06   65355   27.2712   -1.26115   0.0341965   0.000163007   9.24963e-08

Filip solution using Cholesky:
ERROR: Cholesky failed
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