More GLS Models

Math 463, Spring 2017, University of Oregon

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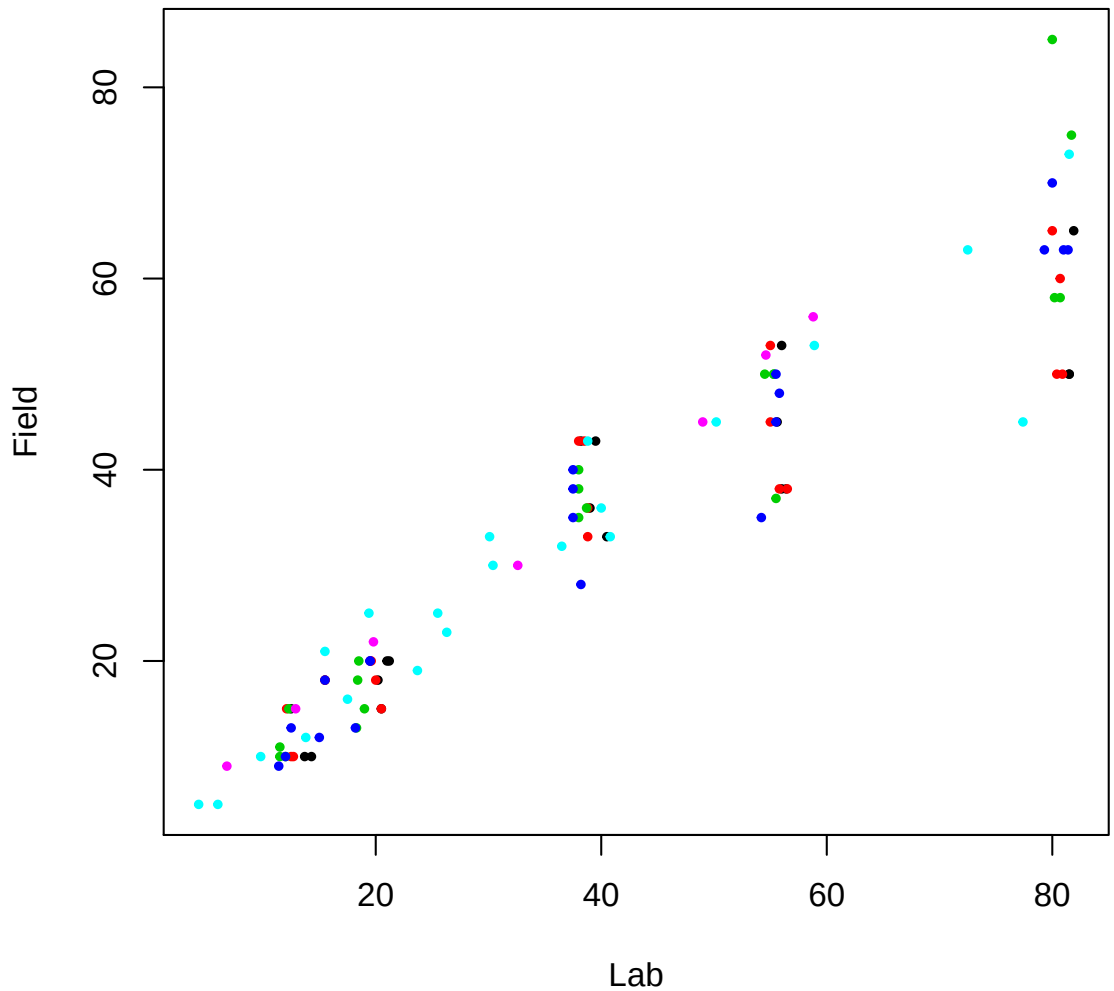
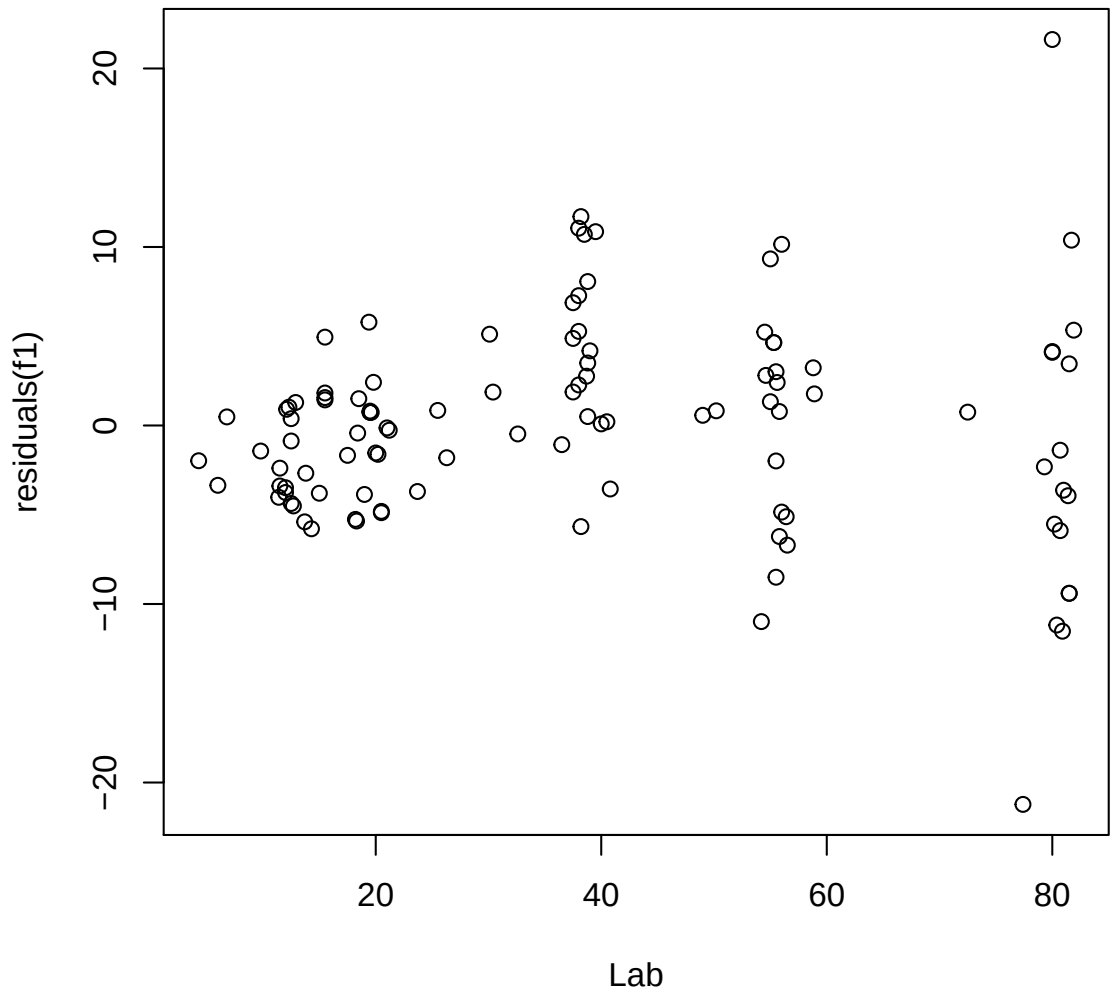
```
> pipe = read.table("http://pages.uoregon.edu/dlevin/DATA/pipeline.txt"
> plot(Field~Lab, col=Batch, data=pipe, pch=19, cex=0.5)
```

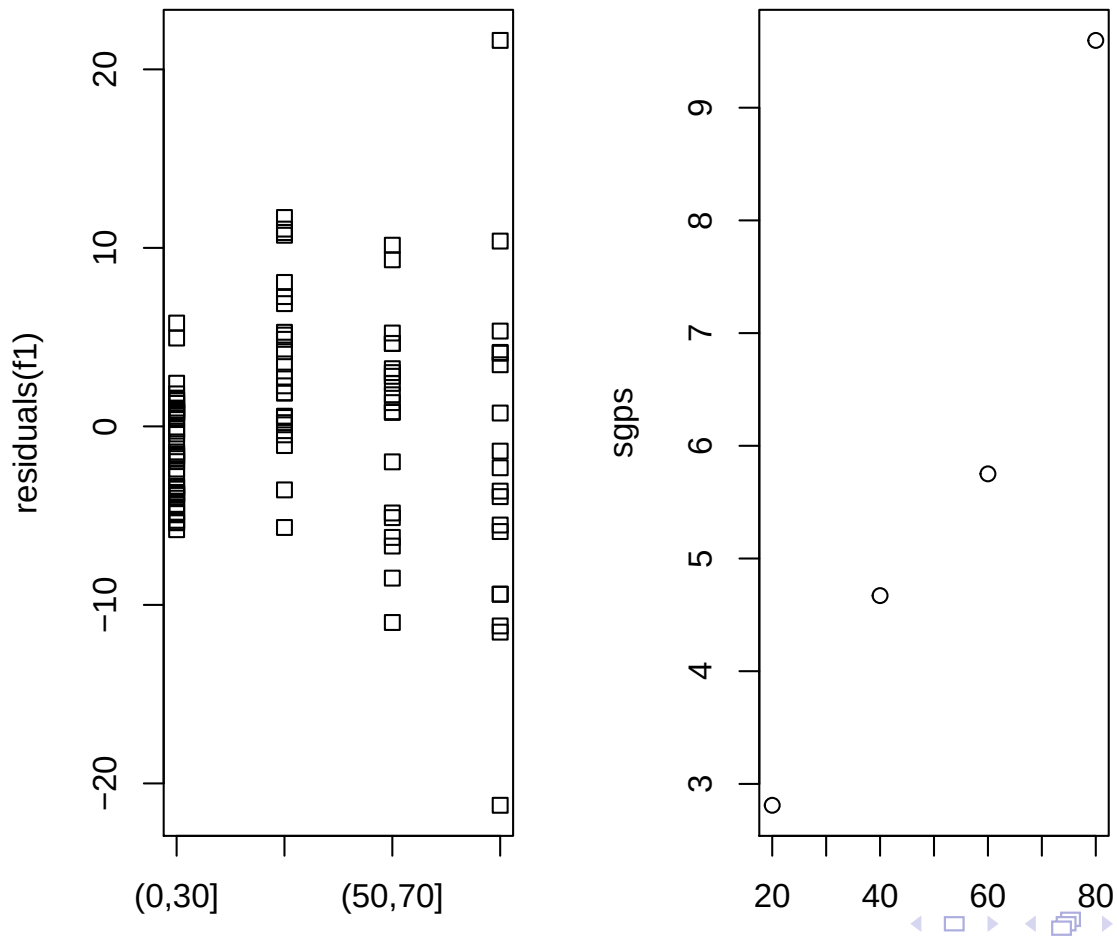


```
> f1 = lm(Field~Lab*Batch, data=pipe)
> plot(residuals(f1)~Lab, data=pipe)
```

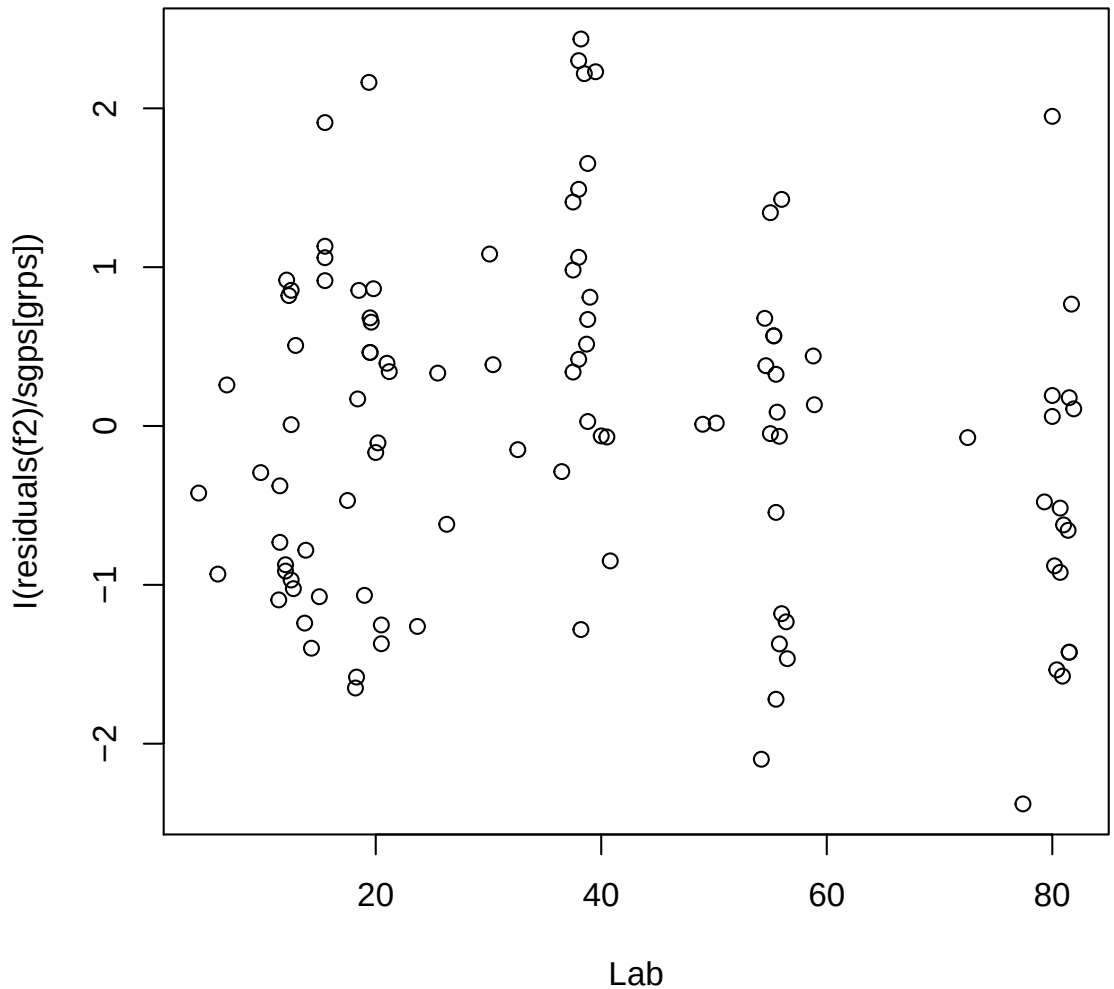
```
> f1 = lm(Field~Lab*Batch, data=pipe)
> plot(residuals(f1)~Lab, data=pipe)
```



```
> grps = cut(pipe$Lab,c(0,30,50,70,90))
> par(mfrow=c(1,2))
> stripchart(residuals(f1)~grps, vertical=T)
> gv = c(20,40,60,80)
> sgps = tapply(residuals(f1),grps,sd)
> plot(sgps~gv)
```



```
> par(mfrow=c(1,1))
> wts =1/sgps[grps]^2
> f2 = lm(Field~Lab*Batch, weights=wts, data=pipe)
> plot(I(residuals(f2)/sgps[grps])~Lab, data=pipe)
```



```
> library(xtable)
> xtable(summary(f1))
```

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	7.2595	2.5674	2.83	0.0056
Lab	0.6086	0.0560	10.88	0.0000
Batch	-0.7544	0.7044	-1.07	0.2866
Lab:Batch	0.0404	0.0161	2.51	0.0137

```
> xtable(summary(f2))
```

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	3.5442	1.6657	2.13	0.0357
Lab	0.7143	0.0566	12.62	0.0000
Batch	-0.1968	0.4504	-0.44	0.6631
Lab:Batch	0.0258	0.0157	1.64	0.1040