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Supplement of

Automation of soil flux chamber measurements: potentials and pitfalls

Carolyn-Monika Görres et al.

Correspondence to: Carolyn-Monika Görres (carolyn.goerres@hs-gm.de)

Figure S1. Newly developed root mat within a LI-8100A collar discovered after collar removal in August 2014.

Figure S2. Regrowth of the vegetation at the poplar plantation after the harvest and subsequent increase in shading of the CO_2 flux measurement plots.

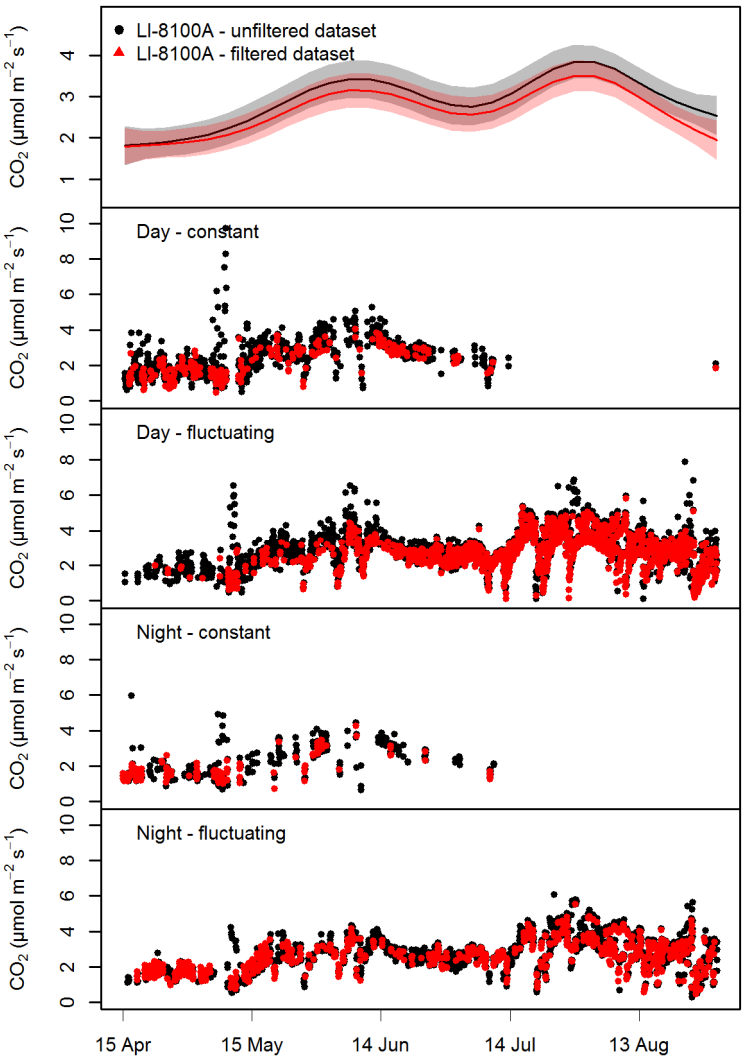
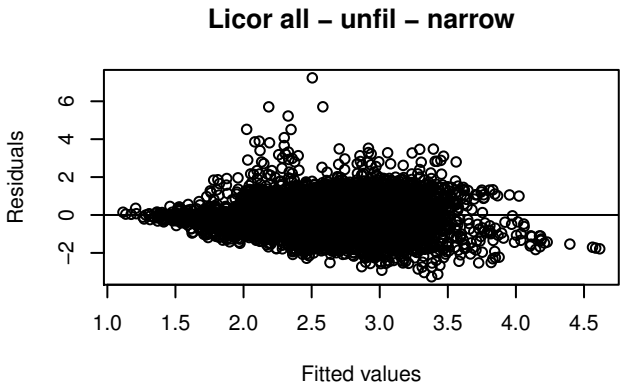


Figure S3. LI-8100A CO_2 flux datasets for the entire monitoring period (narrow rows only). The top panel shows the average daily CO_2 flux and its respective 95 % confidence interval estimated using generalized additive models (GAM) (deviance explained: unfiltered dataset 65.1 % (n=556), filtered dataset 65.6 % (n=545)). In the other panels, the single measured CO_2 fluxes over time were grouped by time of the day and stability of the atmospheric CO_2 concentration at 50 cm above the soil surface. The datasets were divided into day and night based on sun rise and sunset times. Atmospheric CO_2 concentration was considered as constant when the standard deviation for a 3 min measurement prior to the chamber closures was ≤ 1.0 ppm.

Figure S4. Plots of fitted values versus residuals and Q-Q plots for the single model fits of the Lloyd and Taylor model (all = entire flux dataset, open = only measurements made during the open canopy phase, closed = only measurements made during the closed canopy phase, unfil = flux dataset not filtered, fil = filtered flux dataset, narrow = narrow row, wide = wide row; for more details please refer to the associated article).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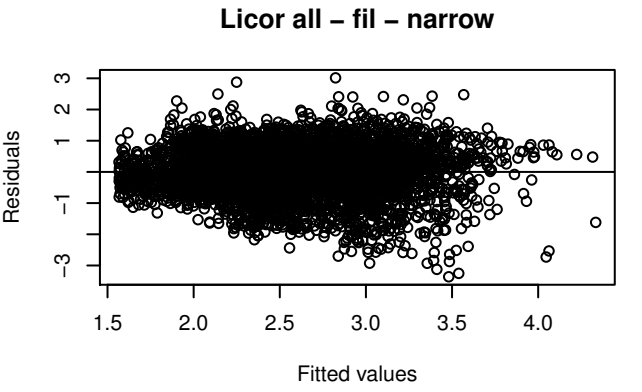
Residuals
Fitted values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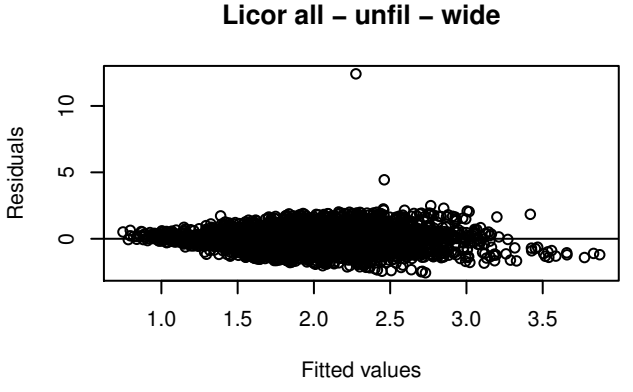
Residuals
Fitted values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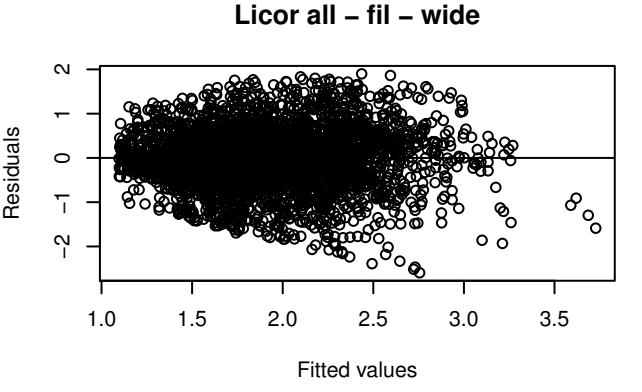
Residuals
Fitted values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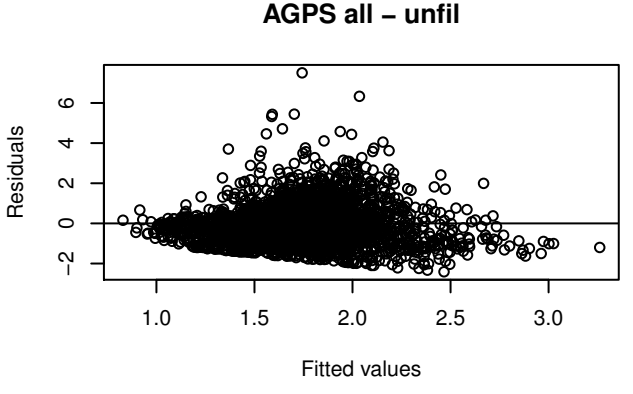
Residuals
Fitted values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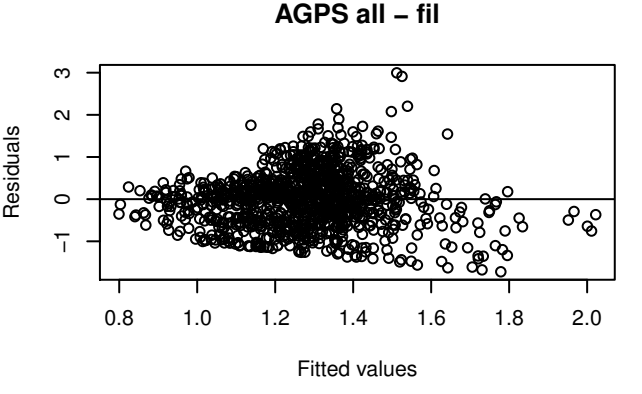
Residuals
Fitted values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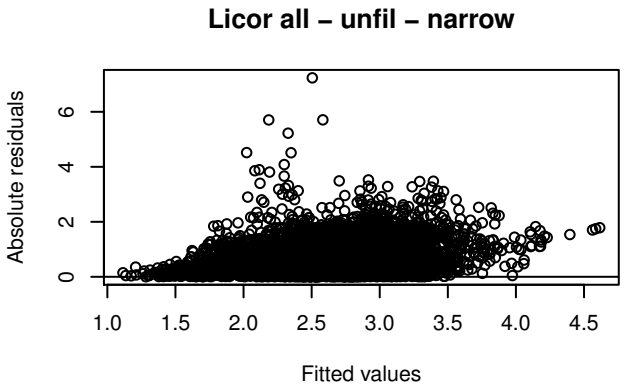
Fitted values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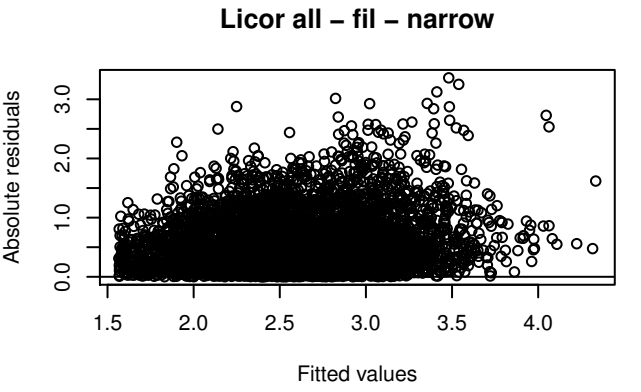
2.5
3.0
3.5
4.0
4.5
Fitted values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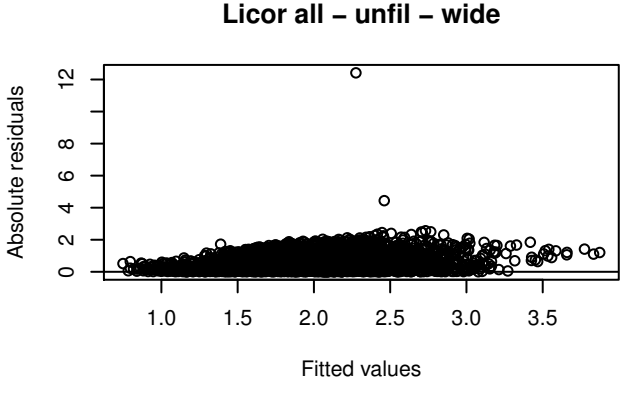
Fitted values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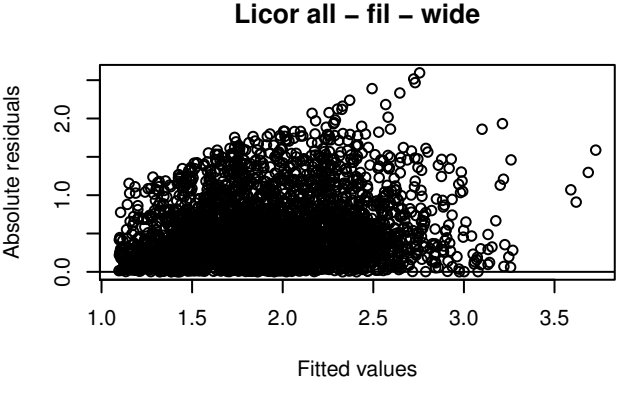
Fitted values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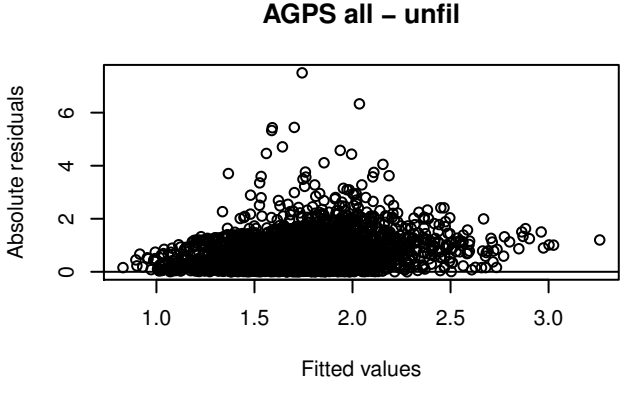
3.0
3.5
Fitted values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1.5
2.0
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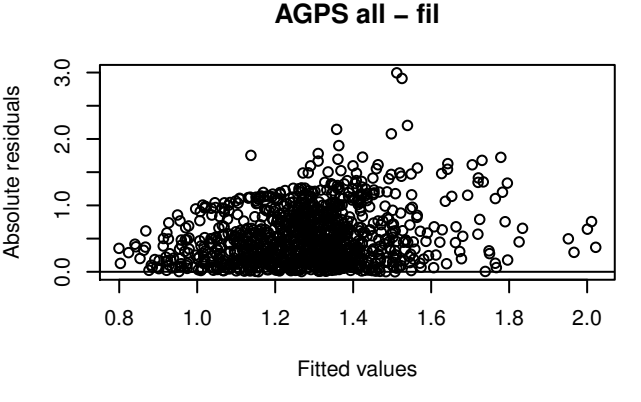
Fitted values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Absolute residuals
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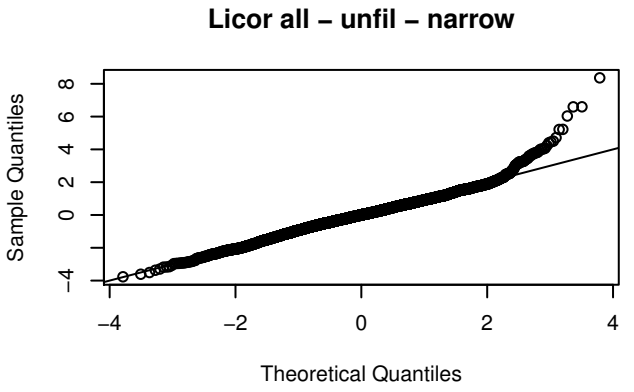
1.6
1.8
2.0
Fitted values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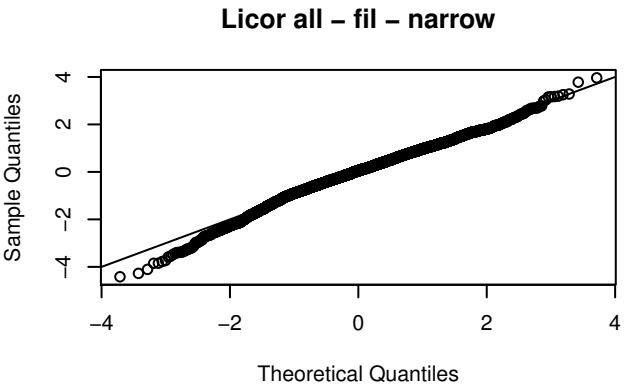
Theoretical Quantiles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Sample Quantiles
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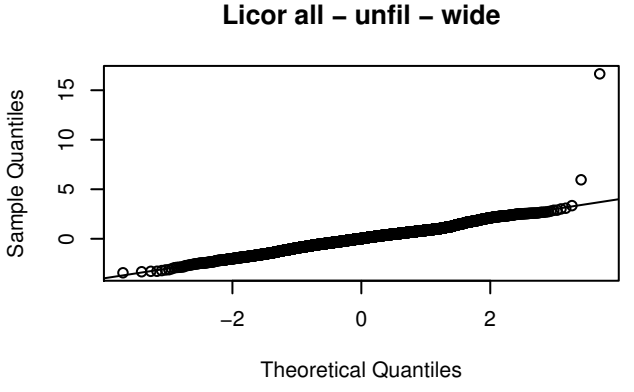
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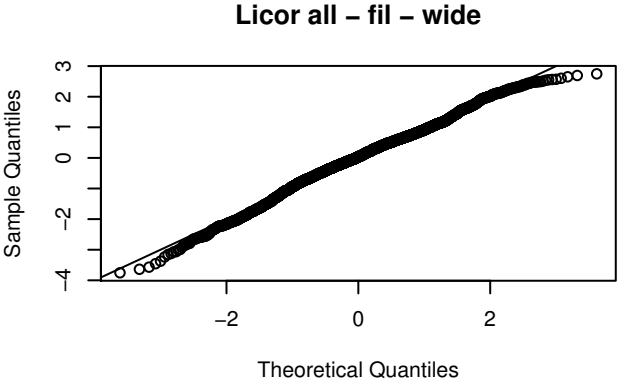
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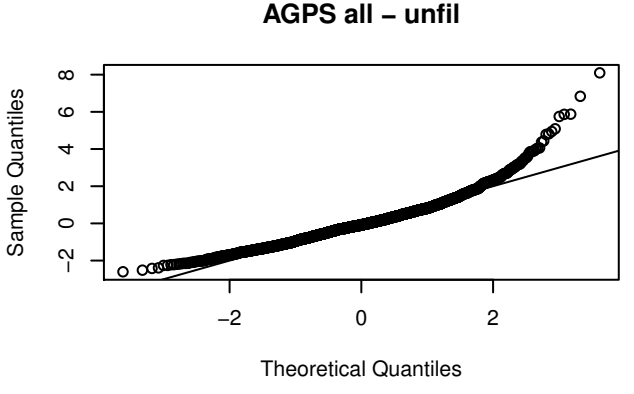
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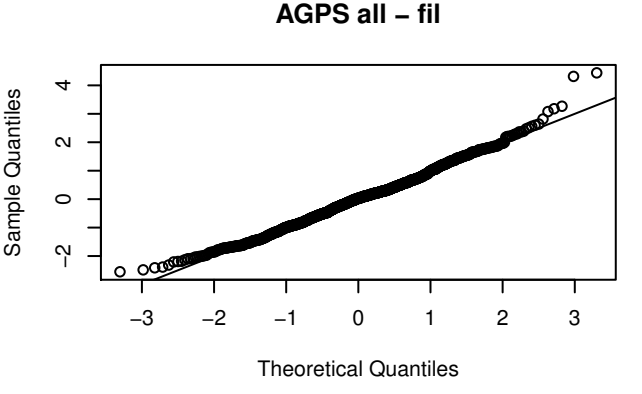
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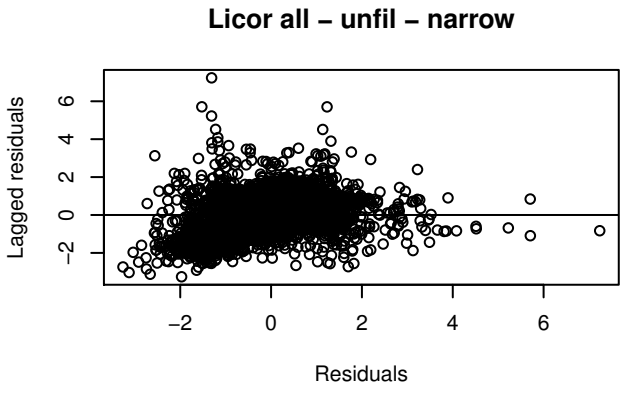
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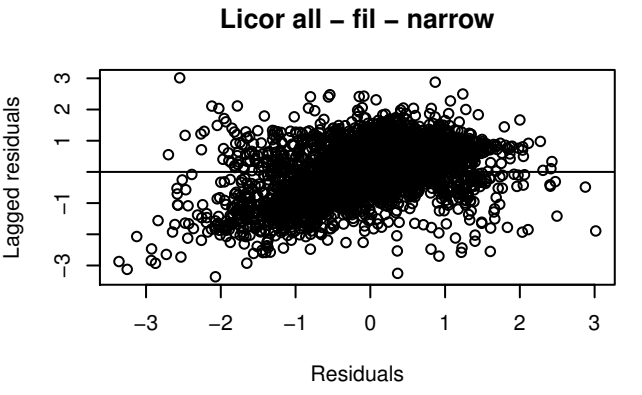
Lagged residuals
Residuals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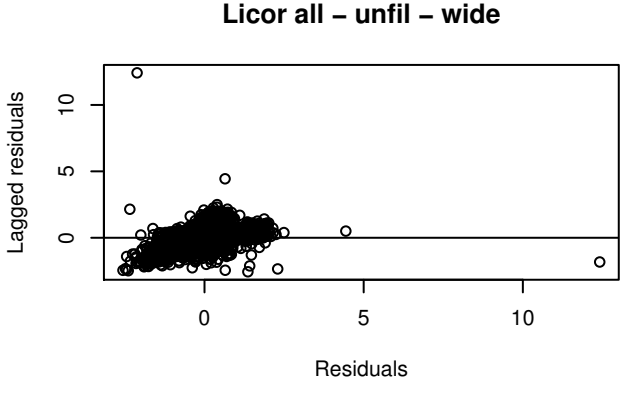
Residuals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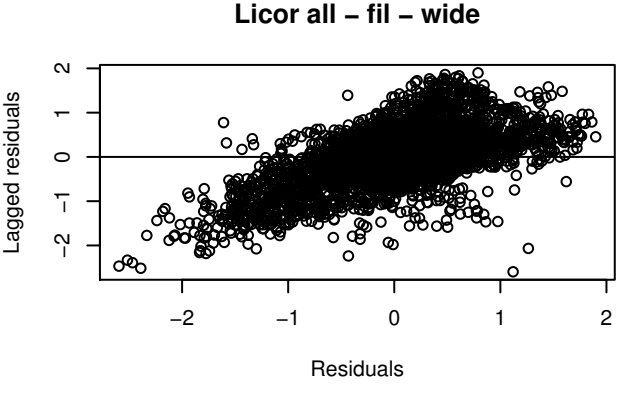
Residuals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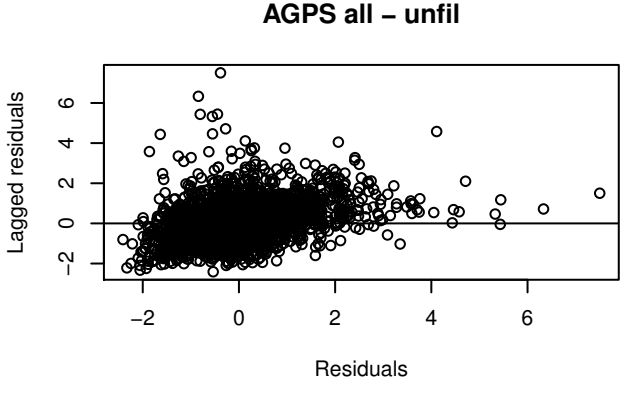
Residuals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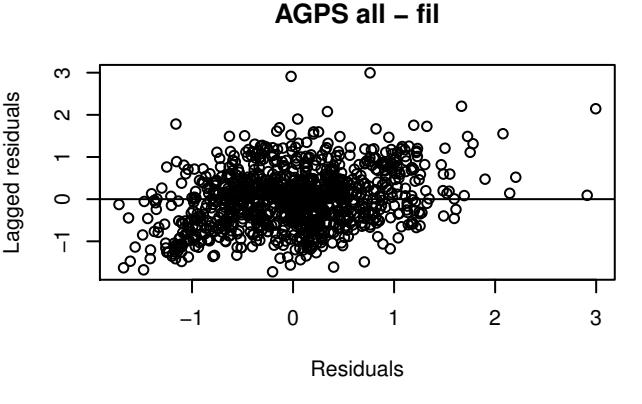
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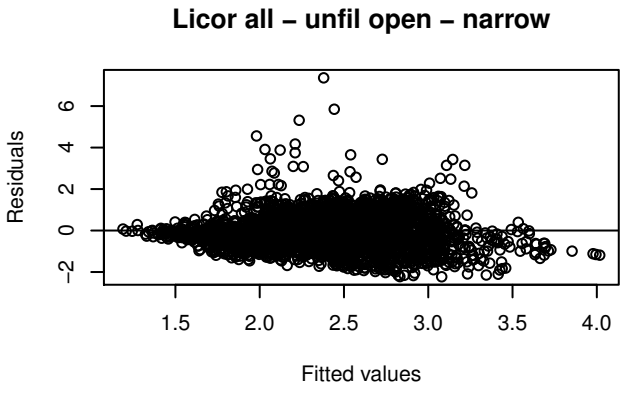
Residuals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Residuals
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2
4
6
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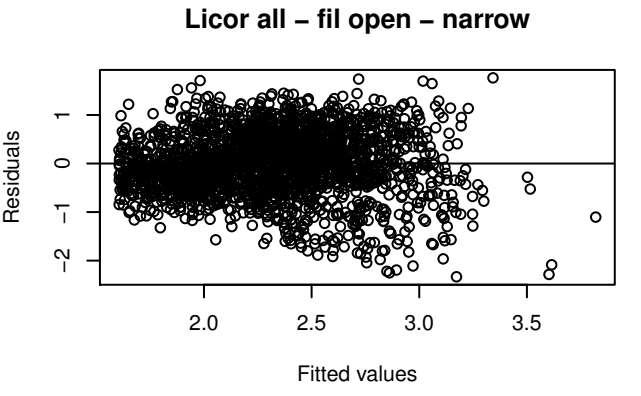
2.0
2.5
3.0
3.5
4.0
Fitted values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Residuals
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−1
0
1
2.0
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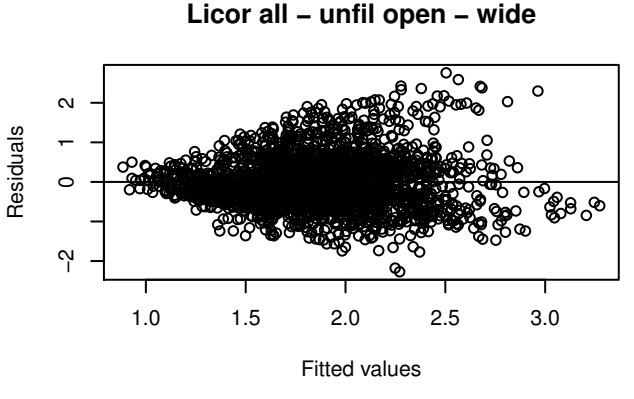
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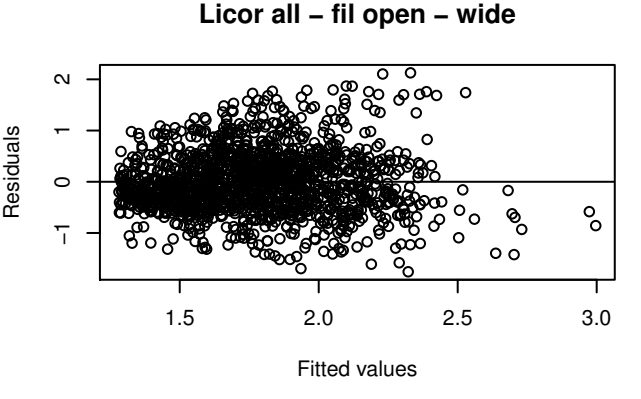
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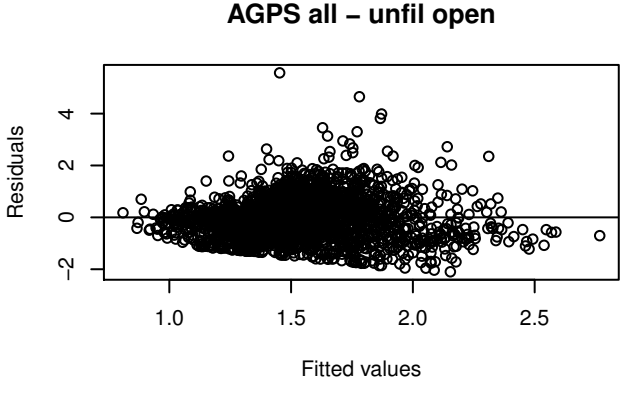
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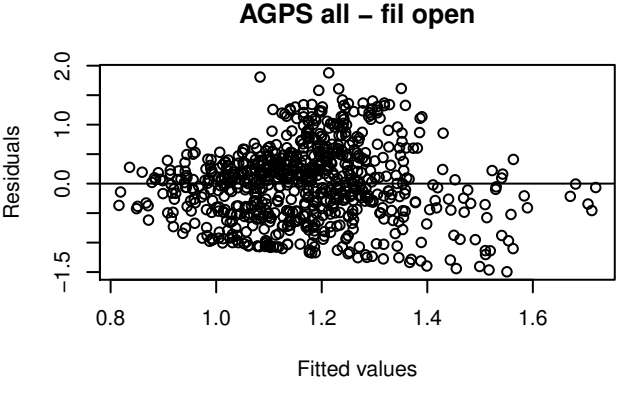
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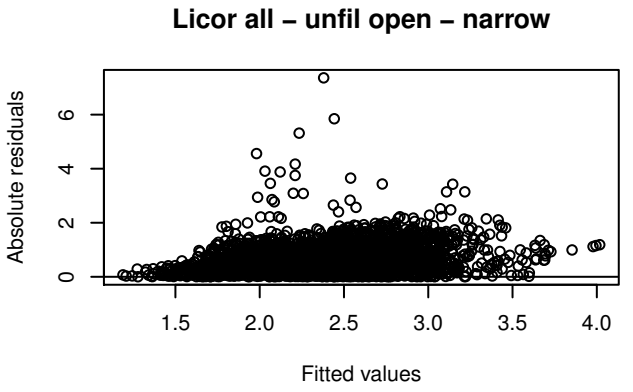
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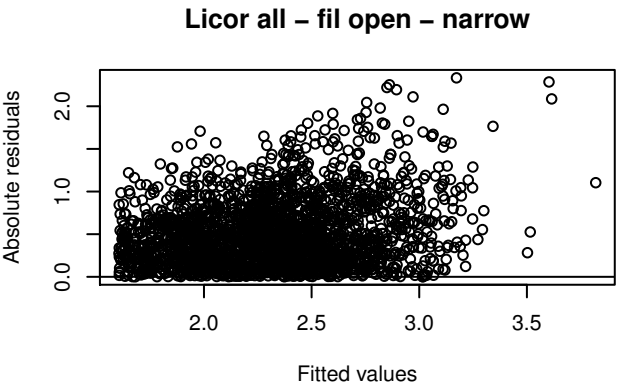
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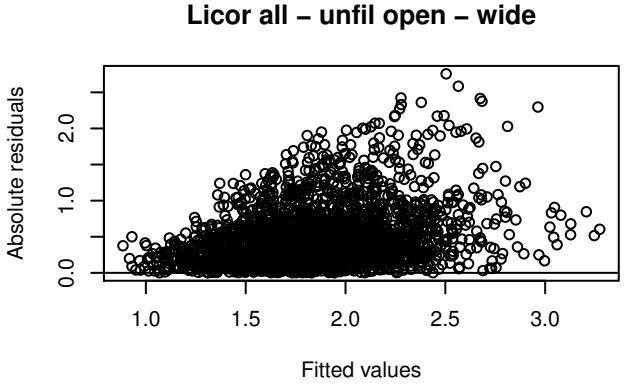
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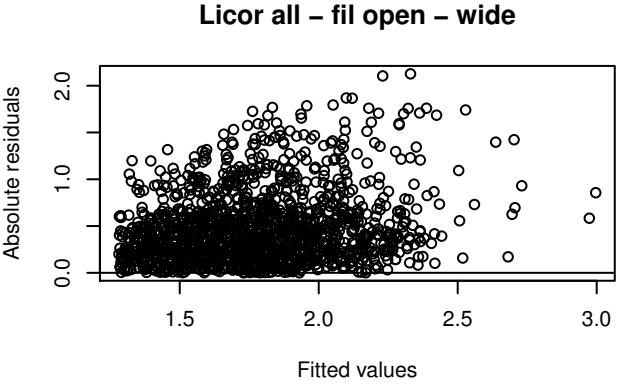
Fitted values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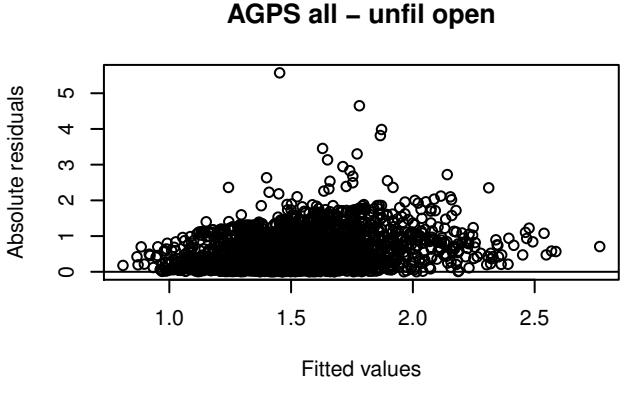
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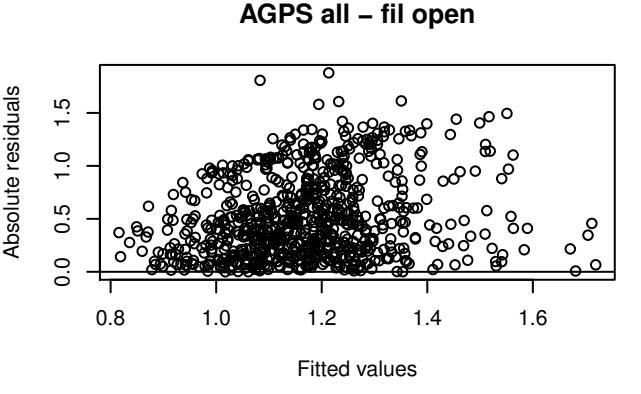
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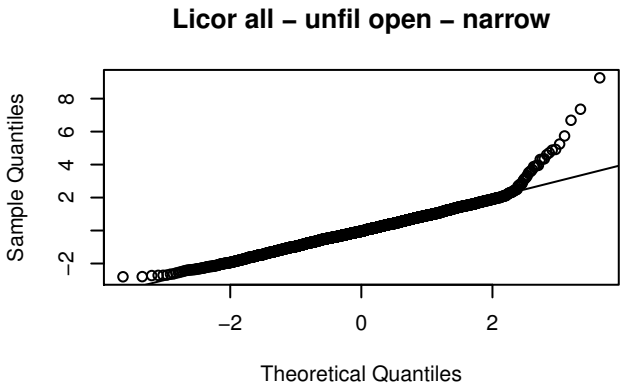
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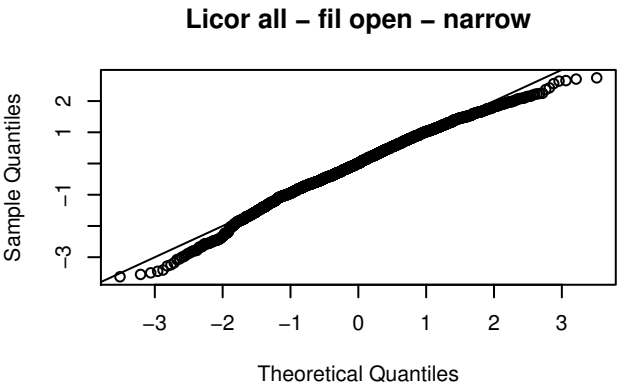
Sample Quantiles
Theoretical Quantiles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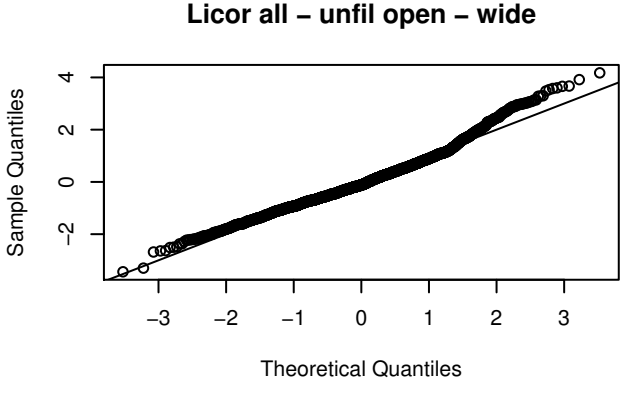
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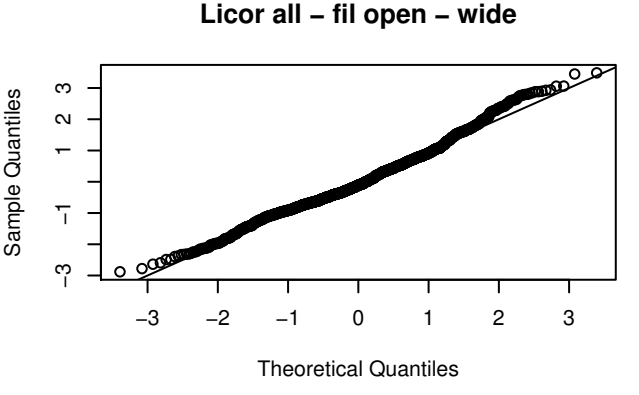
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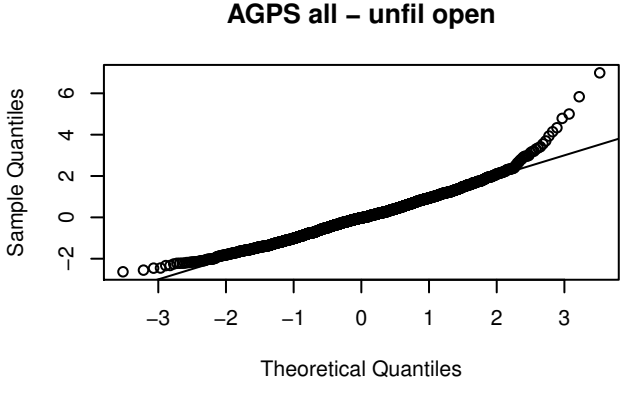
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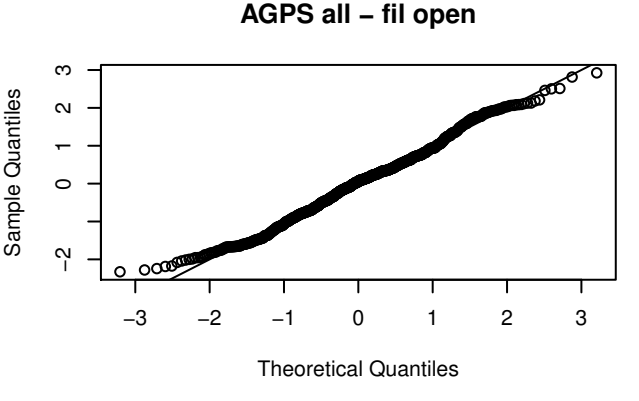
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Sample Quantiles
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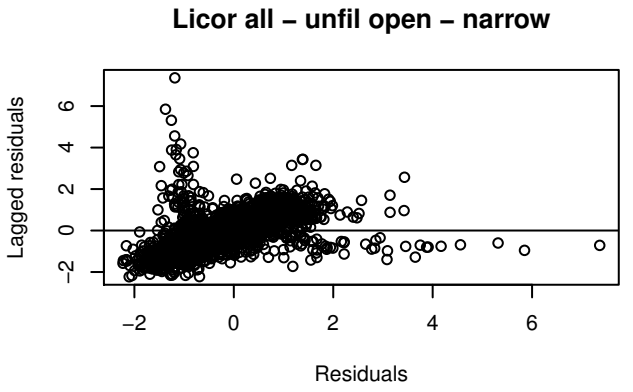
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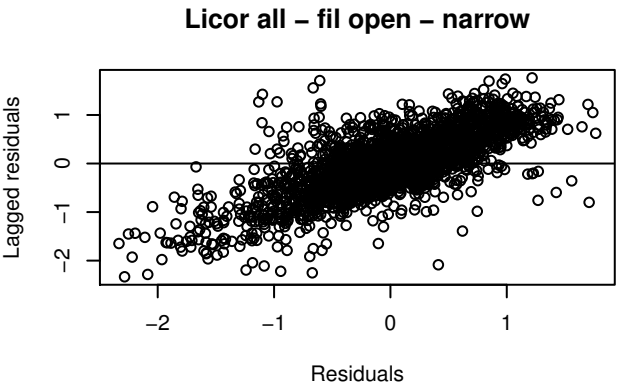
Lagged residuals
Residuals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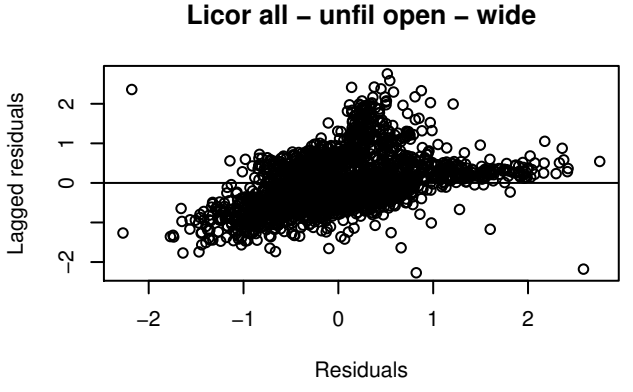
Lagged residuals
Residuals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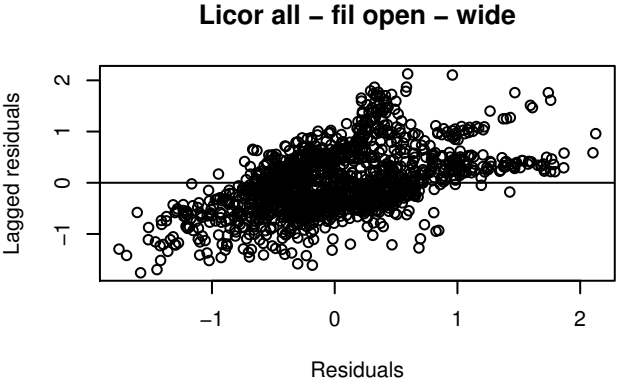
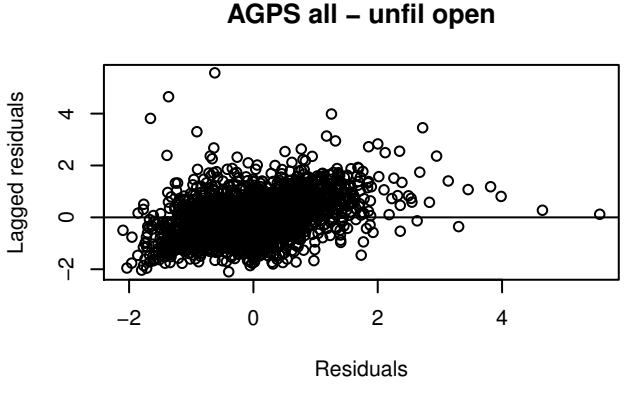
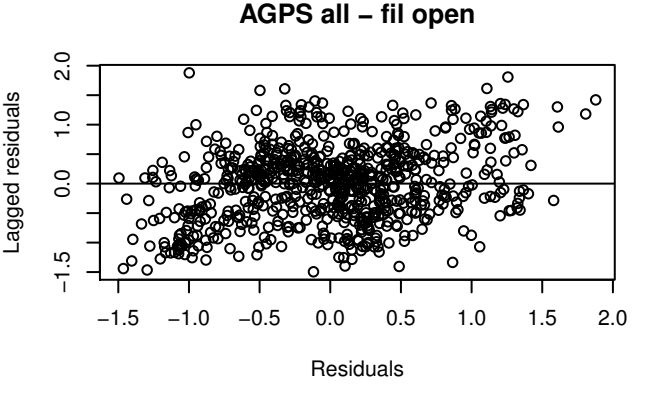
Lagged residuals
Residuals


Licor all – fil open – wide
Lagged residuals
Residuals


AGPS all – unfil open
Lagged residuals
Residuals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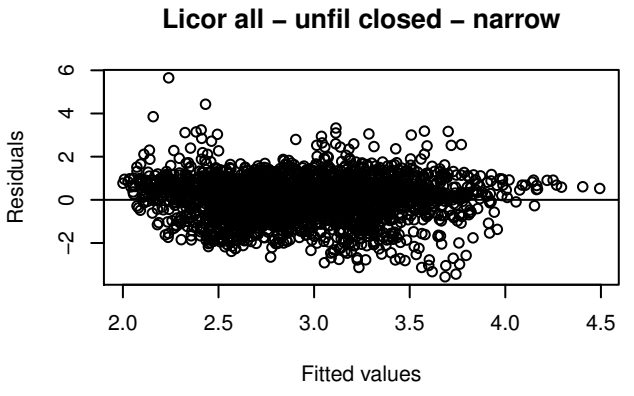
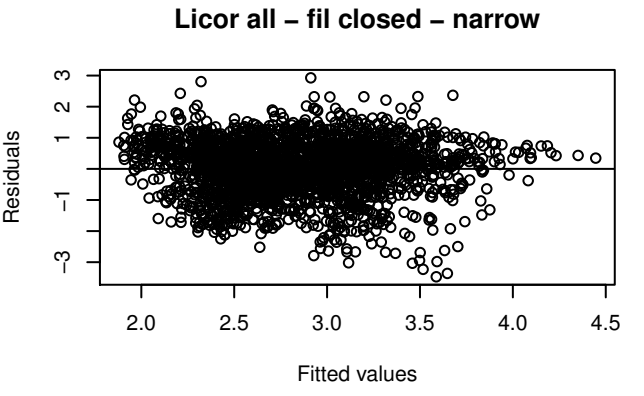
Lagged residuals
Residuals


Licor all – unfil closed – narrow
Residuals
Fitted values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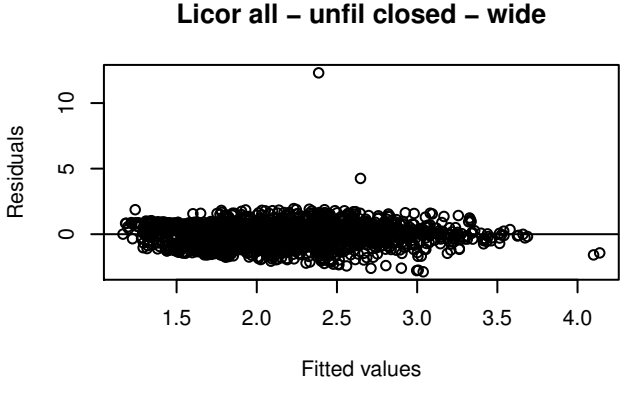
Residuals
Fitted values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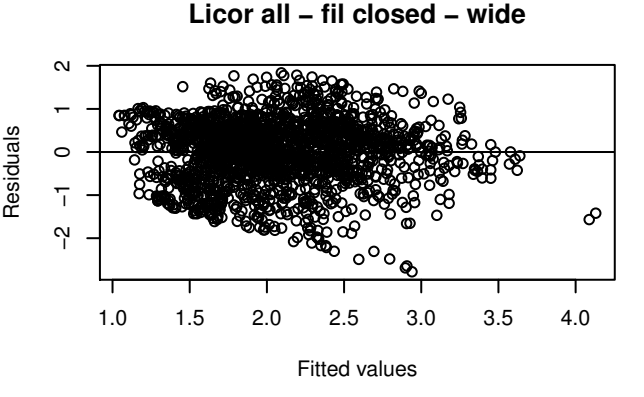
Residuals
Fitted values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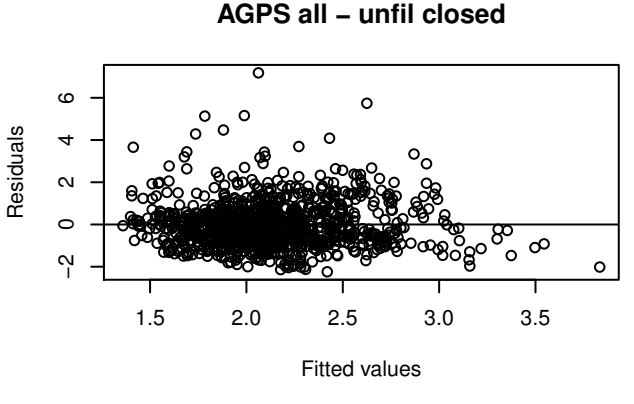
Residuals
Fitted values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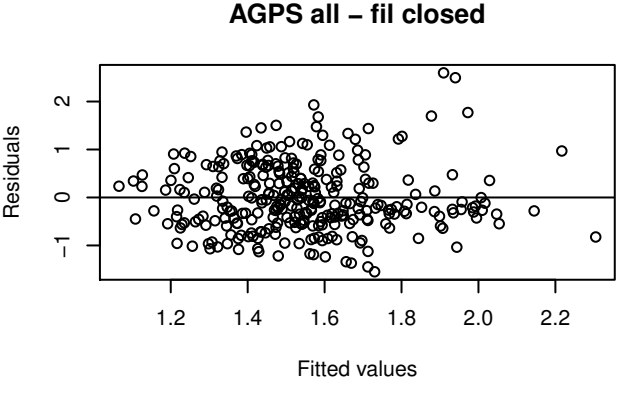
Residuals
Fitted values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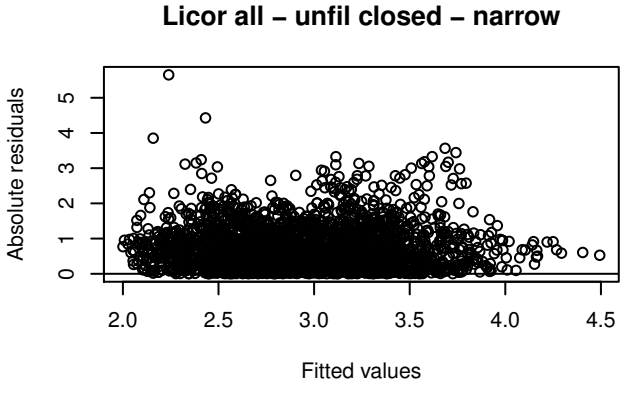
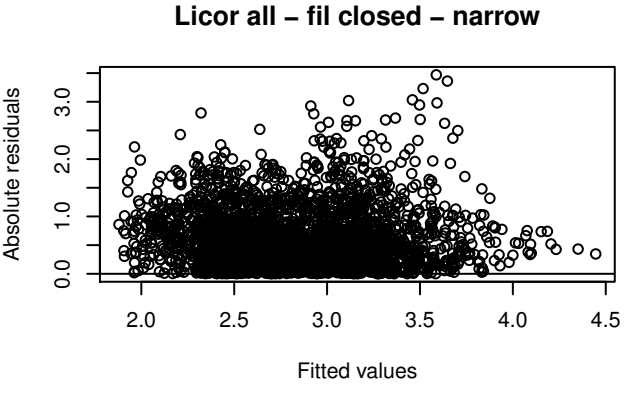
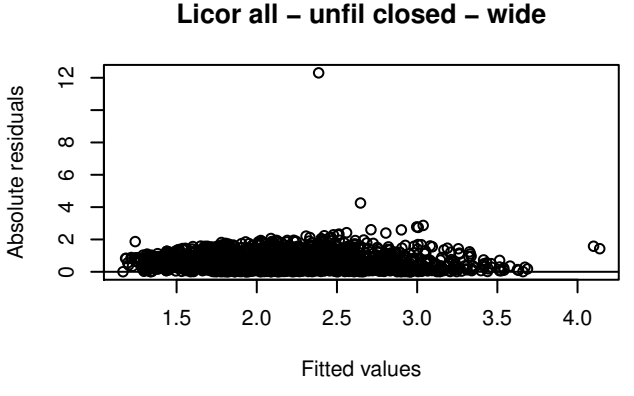
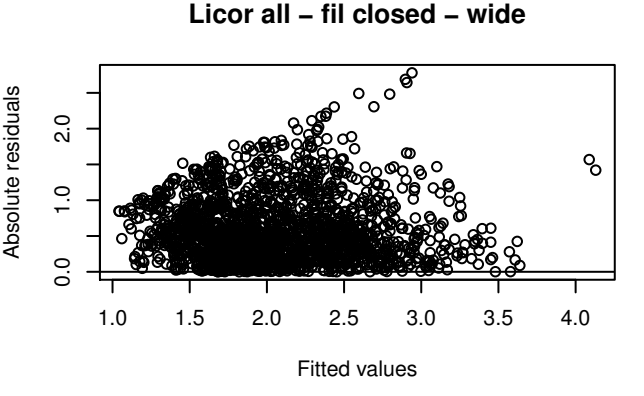
Residuals
Fitted values


Licor all – unfil closed – narrow
Absolute residuals
0 1 2 3 4 5
2.0 2.5 3.0 3.5 4.0 4.5
Fitted values


Licor all – fil closed – narrow
Absolute residuals
0.0 1.0 2.0 3.0
2.0 2.5 3.0 3.5 4.0 4.5
Fitted values


Licor all – unfil closed – wide
Absolute residuals
0 2 4 6 8 12
1.5 2.0 2.5 3.0 3.5 4.0
Fitted values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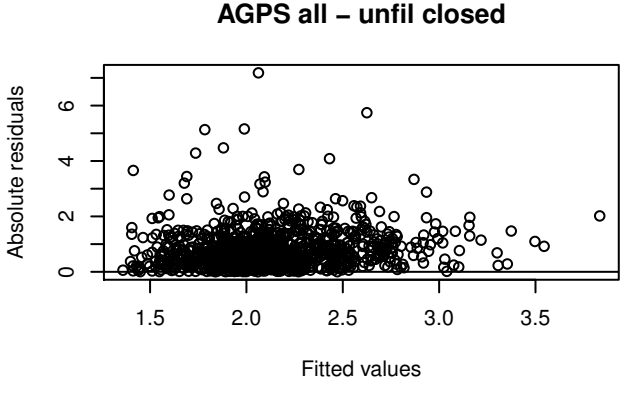
Absolute residuals
0.0 1.0 2.0
1.0 1.5 2.0 2.5 3.0 3.5 4.0
Fitted values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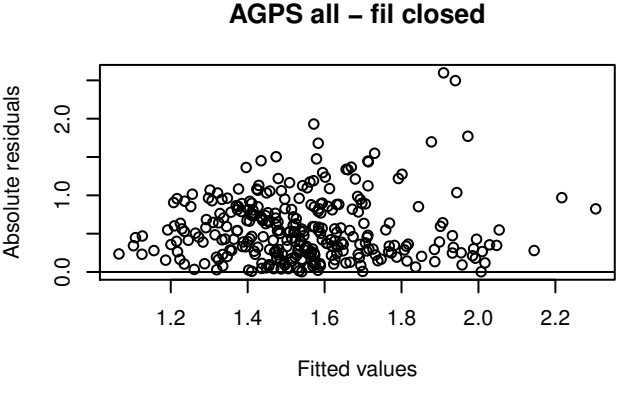
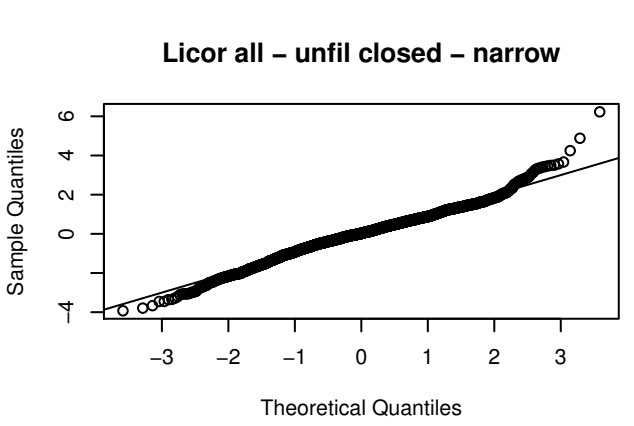
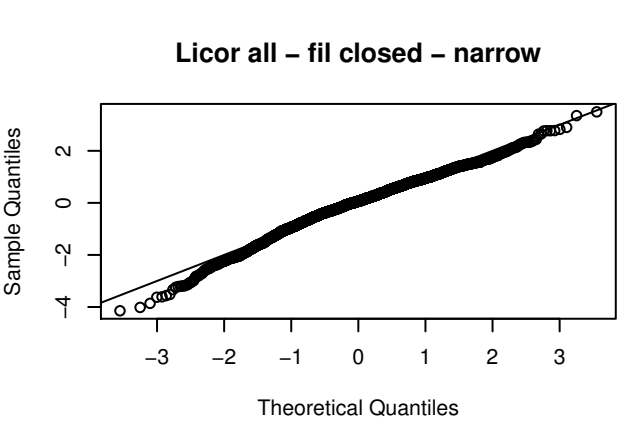
Absolute residuals
0 2 4 6
1.5 2.0 2.5 3.0 3.5
Fitted values


AGPS all – fil closed
Absolute residuals
0.0 1.0 2.0
1.2 1.4 1.6 1.8 2.0 2.2
Fitted values


Licor all – unfil closed – narrow
Sample Quantiles
Theoretical Quantiles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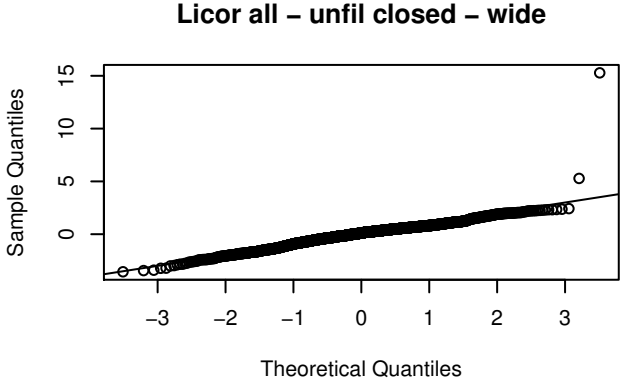
Sample Quantiles
Theoretical Quantiles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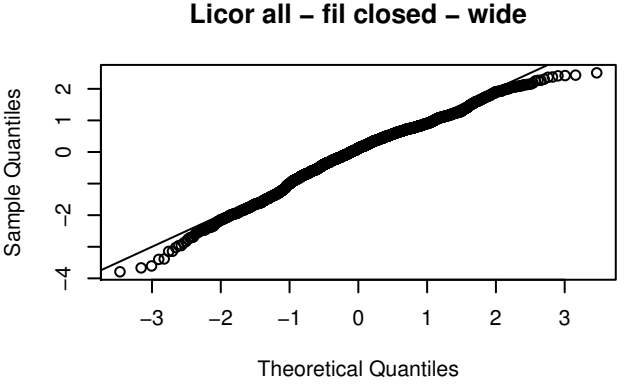
Sample Quantiles
Theoretical Quantiles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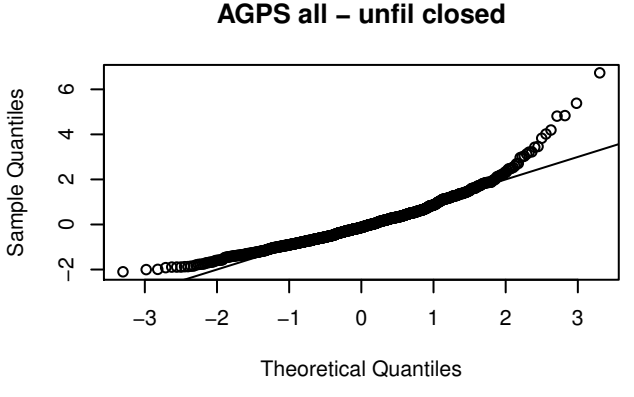
Sample Quantiles
Theoretical Quantiles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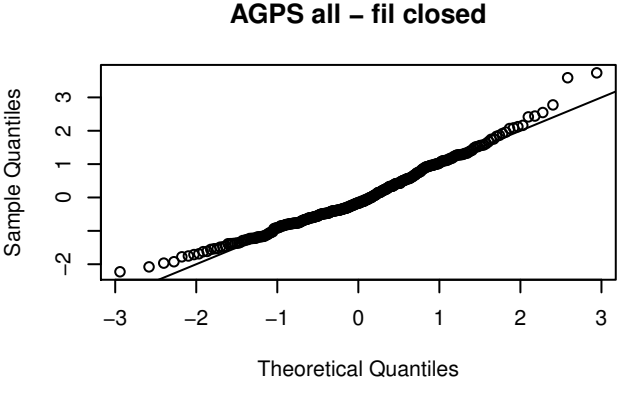
Sample Quantiles
Theoretical Quantiles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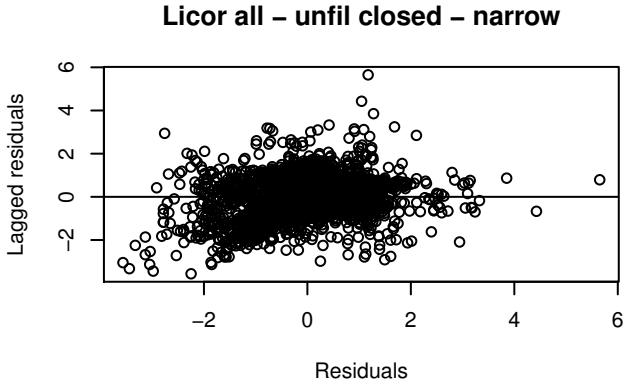
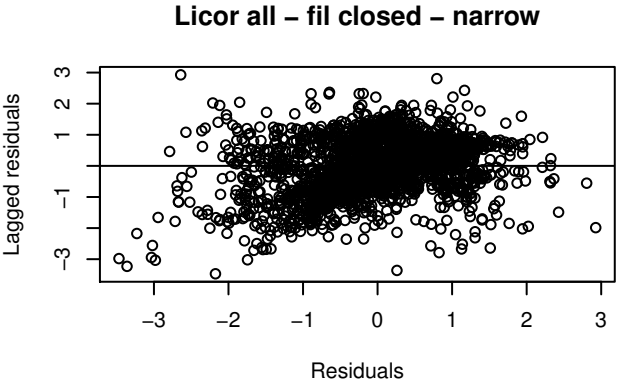
Sample Quantiles
Theoretical Quantiles


Licor all – unfil closed – narrow
Lagged residuals
Residuals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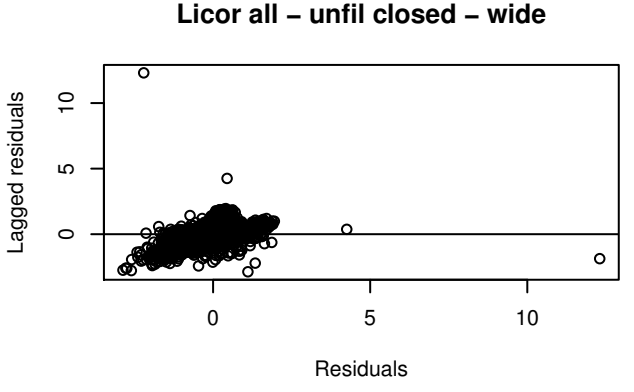
Lagged residuals
Residuals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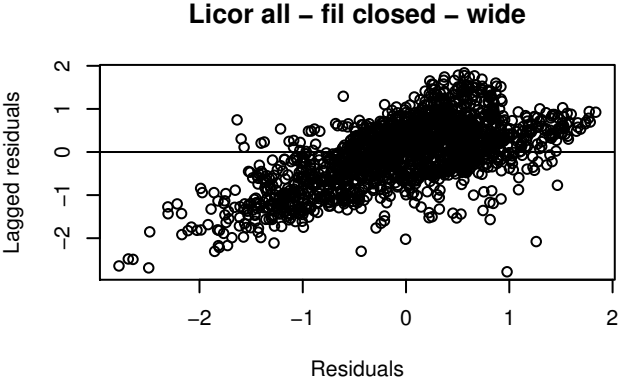
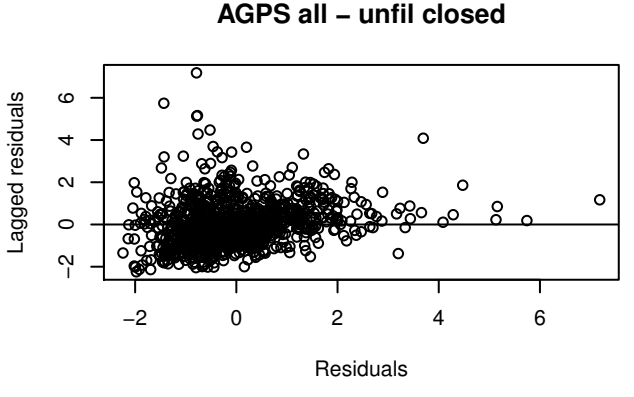
Lagged residuals
Residuals


Licor all – fil closed – wide
Lagged residuals
Residuals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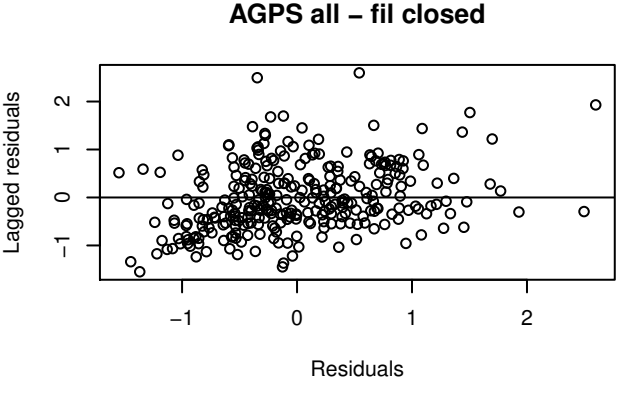
Lagged residuals
Residuals


AGPS all – fil closed
Lagged residuals
Residuals