1) There were detectable sinusoidal signals with 100-day periods in all datasets but the first. The error was found through bootstrapping.
2) There was a detectable secondary cosinusoidal signal in 7,8,9, and 11. In 9, it looked as if there were three signals. I chose the signal with a frequency of 261 as the superior secondary signal.
3) Setting the secondary signal as a nuisance parameter did seem to change the amplitude of the first signal, generally by a factor of ±0.02.

Signal 1

| Dataset | Amplitude of Signal 1 | $\sigma$ from Bootstrapping | Amplitude of Signal 1 Treating Signal 2 as Noise |
|---|---|---|---|
| 1 | 0.009007717291864822 | 0.009441340318258206 | |
| 2 | 0.05027724784699436 | 0.013490455714574702 | |
| 3 | 0.12357579533467708 | 0.014074722800726629 | |
| 4 | 0.31298692794716026 | 0.01370197417238859 | |
| 5 | 0.9816256313174608 | 0.011573363559205184 | |
| 6 | 3.007030416373904 | 0.013159481198139708 | |
| 7 | 0.05387052126050038 | 0.0381553507802817 | 0.034881975583814756 |
| 8 | 0.11217770349128124 | 0.016264467768673213 | 0.0979986597191908 |
| 9 | 0.34832657653991556 | 0.048288121280071795 | 0.3693952854328023 |
| 10 | 0.9781258002196528 | 0.015944696641054662 | |
| 11 | 3.0987686330426034 | 0.04619889634419645 | 2.9623083532778853 |

Signal 2

| Dataset | Offset (2) | Frequency (2) | Amplitude (2) |
|---|---|---|---|
| 7 | 0.4336530987183654 | 138.00025327260306 | 0.5478804296224785 |
| 8 | 0.4916299155994147 | 154.761811014293 | 0.1330995734603772 |
| 9 | 0.3287785757156338 | 260.95069113750543 | 0.8399579894115 |
| 11 | 0.14505709848097884 | 253.44135441822303 | 0.8399579894115 |

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