

# ***SOGA*: Inference of Probabilistic Programs by Second-order Gaussian Approximation Reproducibility Report**

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Table 2: Evaluation of *SOGA* accuracy and runtime as variables increase by using PyMC as ground truth due to PSI timing out. Each row shows the model’s number of variables (# vars), absolute percentage errors ( $|\%e|$ ), and *SOGA* runtime.

| <i>Model</i>                   | <i>SOGA</i>     |              | <i>PyMC</i>     |              | $ \%e $ |
|--------------------------------|-----------------|--------------|-----------------|--------------|---------|
|                                | <i>time (s)</i> | <i>value</i> | <i>time (s)</i> | <i>value</i> |         |
| <i>timeseries</i> <sub>2</sub> | 0.093           | 0.998        | to              | to           | -       |
| <i>timeseries</i> <sub>2</sub> | 0.048           | 2.048        | to              | to           | -       |
| <i>timeseries</i> <sub>2</sub> | 0.050           | 1.999        | to              | to           | -       |
| <i>timeseries</i> <sub>2</sub> | 0.052           | 2.361        | to              | to           | -       |
| <i>timeseries</i> <sub>2</sub> | 0.056           | 2.879        | to              | to           | -       |
| <i>timeseries</i> <sub>2</sub> | 0.067           | 5.347        | to              | to           | -       |
| <i>timeseries</i> <sub>2</sub> | 0.094           | 6.185        | to              | to           | -       |
| <i>timeseries</i> <sub>2</sub> | 0.231           | 6.575        | to              | to           | -       |
| <i>timeseries</i> <sub>2</sub> | 0.293           | 6.622        | to              | to           | -       |
| <i>timeseries</i> <sub>2</sub> | 0.666           | 6.628        | to              | to           | -       |
| <i>timeseries</i> <sub>2</sub> | 0.418           | 6.628        | to              | to           | -       |