**Appendix E2**.

Marginal-likelihood estimates for all analyses. *PC* stands for the partition assignment selected in ClockstaR. *PRi* stands for random partition assignments, where subscript *i* is the number of the replicate. The three simulation replicates are indicated with ‘R*j*,’ where *j* stands for the replicate number.

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| **Number of clock partitions for simulations with true *k*=1 (R1)** | **Marginal-likelihood estimates for partitioning schemes** | | | | | |
| ***PC*** | ***PR1*** | ***PR2*** | ***PR3*** | ***PR4*** | ***PR5*** |
| *k*=1 | -3064.09 | - | - | - | - | - |
| *k*=4 | -3064.55 | -3063.36 | -3058.48 | -3057.25 | -3070.00 | -3064.55 |
| *k*=5 | -3065.20 | -3066.63 | -3057.61 | -3055.97 | -3055.97 | -3055.97 |
| *k*=3 | -3093.47 | -3063.36 | -3058.48 | -3057.25 | -3070.00 | -3064.55 |
| *k*=2 | -3066.97 | -3062.52 | -3057.63 | -3056.40 | -3069.16 | -3063.71 |

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| **Number of clock partitions for simulations with true *k*=1 (R2)** | **Marginal-likelihood estimates for partitioning schemes** | | | | | |
| ***PC*** | ***PR1*** | ***PR2*** | ***PR3*** | ***PR4*** | ***PR5*** |
| *k=1* | -156503.70 | - | - | - | - | - |
| *k*=5 | -156509.70 | -156542.40 | -156557.60 | -156565.9 | -156557.00 | -156565.79 |
| *k*=3 | -156638.00 | -156578.90 | -156578.70 | -156563.4 | -156577.83 | -156562.73 |
| *k*=4 | -156561.10 | -156562.20 | -156592.10 | -156566.6 | -156591.89 | -156566.52 |
| *k*=2 | -156571.70 | -156586.00 | -156590.30 | -156591.10 | -156589.83 | -156590.49 |

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| **Number of clock partitions for simulations with true *k*=1 (R2)** | **Marginal-likelihood estimates for partitioning schemes** | | | | | |
| ***PC*** | ***PR1*** | ***PR2*** | ***PR3*** | ***PR4*** | ***PR5*** |
| *k*=1 | -3064.09 | - | - | - | - | - |
| *k*=4 | -3064.55 | -3063.36 | -3058.48 | -3057.25 | -3070.00 | -3064.55 |
| *k*=5 | -3065.20 | -3066.63 | -3057.61 | -3055.97 | -3055.97 | -3055.97 |
| *k*=3 | -3093.47 | -3063.36 | -3058.48 | -3057.25 | -3070.00 | -3064.55 |
| *k*=2 | -3066.97 | -3062.52 | -3057.63 | -3056.40 | -3069.16 | -3063.71 |

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| **Number of clock partitions for simulations with true *k*=1 (R3)** | **Marginal-likelihood estimates for partitioning schemes** | | | | | |
| ***PC*** | ***PR1*** | ***PR2*** | ***PR3*** | ***PR4*** | ***PR5*** |
| *k=1* | -196431.00 | - | - | - | - | - |
| *k*=4 | -196432.90 | -196442.80 | -196442.80 | -196455.50 | -196443.05 | -196455.51 |
| *k*=5 | -196438.70 | -196444.20 | -196456.90 | -196466.70 | -196457.27 | -196467.24 |
| *k*=2 | -196449.50 | -196465.50 | -196466.80 | -196466.90 | -196467.57 | -196467.02 |
| *k*=3 | -196517.20 | -196524.80 | -196525.80 | -196534.40 | -196526.45 | -196534.93 |

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| **Number of clock partitions for simulations with true *k*=2 (R1)** | **Marginal-likelihood estimates for partitioning schemes** | | | | | |
| ***PC*** | ***PR1*** | ***PR2*** | ***PR3*** | ***PR4*** | ***PR5*** |
| *k*=2 | -17981.22 | -18570.38 | -18549.52 | -18567.79 | -18570.14 | -18355.34 |
| *k*=3 | -17990.88 | -18546.97 | -18406.49 | -18499.20 | -18438.58 | -18434.84 |
| *k*=4 | -18001.97 | -18590.83 | -18504.95 | -18332.36 | -18538.05 | -18178.15 |
| *k*=5 | -18010.91 | -18402.68 | -18370.72 | -18494.12 | -18402.23 | -18364.99 |
| *k*=1 | -18557.34 | - | - | - | - | - |

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| **Number of clock partitions for simulations with true *k*=2 (R2)** | **Marginal-likelihood estimates for partitioning schemes** | | | | | |
| ***PC*** | ***PR1*** | ***PR2*** | ***PR3*** | ***PR4*** | ***PR5*** |
| *k*=2 | -167028.50 | -170066.20 | -170068.80 | -170107.50 | -170067.95 | -170107.17 |
| *k*=4 | -167981.60 | -169020.80 | -169791.50 | -170021.50 | -169790.68 | -170020.77 |
| *k*=5 | -168019.30 | -169469.30 | -169482.70 | -169532.00 | -169481.82 | -169531.25 |
| *k*=3 | -169005.10 | -169308.00 | -169665.90 | -169904.10 | -169665.02 | -169904.00 |
| *k*=1 | -170246.30 | - | - | - | - | - |

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| **Number of clock partitions for simulations with true *k*=2 (R3)** | **Marginal-likelihood estimates for partitioning schemes** | | | | | |
| ***PC*** | ***PR1*** | ***PR2*** | ***PR3*** | ***PR4*** | ***PR5*** |
| *k*=2 | -193576.40 | -195144.40 | -195184.30 | -195007.90 | -195008.14 | -195008.56 |
| *k*=3 | -193579.90 | -195086.00 | -194638.60 | -194687.80 | -195183.62 | -195007.42 |
| *k*=4 | -194687.64 | -195145.39 | -195185.10 | -195008.24 | -194638.98 | -194687.88 |
| *k*=1 | -195006.89 | - | - | - | - | - |
| *k*=5 | -195007.27 | -194638.47 | -194687.10 | -195007.69 | -195007.33 | -194687.83 |

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| **Number of clock partitions for simulatinos with true *k*=3 (R1)** | **Marginal-likelihood estimates for partitioning schemes** | | | | | |
| ***PC*** | ***PR1*** | ***PR2*** | ***PR3*** | ***PR4*** | ***PR5*** |
| *k*=3 | -11241.21 | -11310.94 | -11328.81 | -11306.29 | -11321.53 | -11320.29 |
| *k*=4 | -11249.92 | -11309.64 | -11301.87 | -11323.21 | -11319.70 | -11312.07 |
| *k*=5 | -11257.64 | -11320.40 | -11327.51 | -11310.12 | -11300.93 | -11316.87 |
| *k*=2 | -11270.42 | -11319.17 | -11307.90 | -11304.51 | -11318.42 | -11318.51 |
| *k*=1 | -11311.46 | - | - | - | - | - |

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| **Number of clock partitions for simulatinos with true *k*=3 (R2)** | **Marginal-likelihood estimates for partitioning schemes** | | | | | |
| ***PC*** | ***PR1*** | ***PR2*** | ***PR3*** | ***PR4*** | ***PR5*** |
| *k*=3 | -131996.08 | -133106.80 | -133174.00 | -133444.90 | -133174.13 | -133445.36 |
| *k*=4 | -132001.50 | -132963.80 | -133222.40 | -133102.30 | -133223.00 | -133102.50 |
| *k*=5 | -132403.90 | -133250.70 | -133264.00 | -133446.10 | -133264.08 | -133446.82 |
| *k*=2 | -132757.00 | -133381.80 | -133505.50 | -133568.10 | -133505.66 | -133568.87 |
| *k*=1 | -132952.30 | - | - | - | - | - |

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| **Number of clock partitions for simulatinos with true *k*=3 (R3)** | **Marginal-likelihood estimates for partitioning schemes** | | | | | |
| ***PC*** | ***PR1*** | ***PR2*** | ***PR3*** | ***PR4*** | ***PR5*** |
| *k*=3 | -121994.36 | -123100.68 | -123170.02 | -123443.47 | -210387.13 | -323466.11 |
| *k*=4 | -121997.64 | -122961.35 | -123221.11 | -123094.68 | -173968.26 | -218599.95 |
| *k*=5 | -122397.39 | -123245.048 | -123259.57 | -123445.31 | -162224.26 | -316193.07 |
| *k*=2 | -122754.10 | -123378.56 | -123501.49 | -123567.89 | -164945.97 | -218873.54 |
| *k*=1 | -122944.49 | - | - | - | - | - |

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| **Number of clock partitions for the Pinnipeds data set** | **Marginal-likelihood estimates for partitioning schemes** | | | | | |
| ***PC*** | ***PR1*** | ***PR2*** | ***PR3*** | ***PR4*** | ***PR5*** |
| *k*=2 | -25423.34 | -26667.82 | -26696.70 | -26688.81 | -29559.79 | -26701.06 |
| *k*=5 | -25424.93 | -26495.03 | -26395.40 | -26524.22 | -26570.09 | -94984.20 |
| *k*=4 | -26403.28 | -26403.28 | -26527.80 | -26608.64 | -26526.25 | -31965.22 |
| *k*=3 | -26685.36 | -26685.36 | -26331.48 | -26374.81 | -26422.33 | -28725.62 |
| *k*=1 | -26697.19 | - | - | - | - | - |

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| **Number of clock partitions for the *Orcinus orca* data set** | **Marginal-likelihood estimates for partitioning schemes** | | | | | |
| ***PC*** | ***PR1*** | ***PR2*** | ***PR3*** | ***PR4*** | ***PR5*** |
| *k*=1 | -3114.71 | NA | NA | NA | NA | NA |
| *k*=2 | -4666.62 | -4674.46 | -4671.33 | -4704.45 | -4692.90 | -4682.90 |
| *k*=4 | -4681.79 | -4706.00 | -4713.81 | -4710.08 | -4738.63 | -4712.08 |
| *k*=3 | -4687.74 | -4716.13 | -4688.08 | -4710.02 | -4693.46 | -4735.50 |
| *k*=5 | -4761.44 | -4731.94 | -4734.17 | 1967.95 | -4729.11 | -4713.17 |

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| **Number of clock partitions for the HPV-16 data set** | **Marginal-likelihood estimates for partitioning schemes** | | | | | |
| ***Pc*** | ***Pr1*** | ***Pr2*** | ***Pr3*** | ***Pr4*** | ***Pr5*** |
| *k*=1 | -39331.05 | - | - | - | - | - |
| *k*=3 | -39333.18 | -39397.19 | -39255.42 | -39353.17 | -39241.97 | -39361.41 |
| *k*=2 | -39381.43 | -39395.67 | -39261.22 | -39396.48 | -39450.08 | -39389.22 |
| *k*=5 | -39386.03 | -39316.24 | -39424.76 | -39243.47 | -39383.32 | -39372.13 |
| *k*=4 | -39342.84 | -39315.69 | -39363.49 | -39364.14 | -39321.29 | -39367.00 |