**Table S154.** The results of the compared algorithms in the IV-set case.

| **Algorithm**, | Parameter | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| metric | *I*01 (A) | *n*1 | *R*p1 (Ω) | *I*02 (A) | *n*2 | *R*p2 (Ω) | *R*s (Ω) | *I*ph (A) | RMSPE |
|  |  |  |  |  | ***T* = 260 K** |  |  |  |  |
| true value | 1.50000E-05 | 6.37044E+00 | 1.00000E+04 | 8.96101E-06 | 2.92308E+00 | 1.41753E+04 | 1.00000E+01 | 9.60000E-04 | 5.55000E+02 |
| **DE** |  |  |  |  |  |  |  |  |  |
| MEAN | 4.69057E-05 | 6.30708E+00 | 2.97192E+04 | 8.65745E-06 | 2.71501E+00 | 1.40692E+04 | 6.56303E+01 | 1.16043E-03 | 1.89083E-01 |
| MEDIAN | 2.62622E-06 | 4.91376E+00 | 2.07122E+03 | 8.39149E-06 | 2.74341E+00 | 1.38837E+04 | 5.31154E+01 | 1.10392E-03 | 1.36102E-01 |
| STD | 1.40807E-04 | 4.83826E+00 | 1.19197E+05 | 1.87434E-06 | 4.85664E-01 | 1.10024E+03 | 6.97079E+01 | 2.23934E-04 | 9.49094E-02 |
| IQR | 1.90272E-05 | 3.82747E+00 | 6.99210E+03 | 2.07603E-06 | 8.01925E-01 | 1.32071E+03 | 8.70225E+01 | 2.75091E-04 | 1.61708E-01 |
| **EBLSHADE** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.01388E-05 | 5.49038E+00 | 7.76643E+03 | 8.16611E-06 | 2.67787E+00 | 1.37765E+04 | 6.74898E+01 | 1.08004E-03 | 1.19451E-01 |
| MEDIAN | 9.90953E-06 | 6.12537E+00 | 6.31620E+03 | 8.95342E-06 | 2.88690E+00 | 1.41506E+04 | 2.55399E+01 | 9.97449E-04 | 1.00133E-01 |
| STD | 4.86370E-05 | 2.63941E+00 | 1.04179E+04 | 1.11268E-06 | 3.26014E-01 | 5.46121E+02 | 6.89751E+01 | 1.75238E-04 | 4.15560E-02 |
| IQR | 1.48880E-05 | 3.38745E+00 | 8.60682E+03 | 1.57957E-06 | 5.17435E-01 | 8.15200E+02 | 1.16329E+02 | 1.68848E-04 | 1.82019E-02 |
| **ADELI** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.48003E-05 | 6.35177E+00 | 9.74887E+03 | 8.96080E-06 | 2.92295E+00 | 1.41751E+04 | 1.03086E+01 | 9.60447E-04 | 9.95037E-02 |
| MEDIAN | 1.49998E-05 | 6.37041E+00 | 1.00019E+04 | 8.96101E-06 | 2.92307E+00 | 1.41753E+04 | 1.00025E+01 | 9.59996E-04 | 9.95037E-02 |
| STD | 5.31369E-07 | 5.01535E-02 | 6.44912E+02 | 5.75513E-10 | 3.56841E-04 | 4.83078E-01 | 8.28714E-01 | 1.22281E-06 | 1.83374E-08 |
| IQR | 4.36500E-12 | 3.89500E-07 | 7.23000E-03 | 0.00000E+00 | 2.50000E-09 | 0.00000E+00 | 3.90000E-07 | 6.00000E-13 | 0.00000E+00 |
| **NDE** |  |  |  |  |  |  |  |  |  |
| MEAN | 6.14289E-05 | 8.48588E+00 | 5.08184E+04 | 7.64602E-06 | 2.41768E+00 | 1.40726E+04 | 1.30758E+02 | 5.01164E-03 | 2.74711E-01 |
| MEDIAN | 3.52725E-06 | 5.19947E+00 | 2.31607E+03 | 8.93042E-06 | 2.90231E+00 | 1.41535E+04 | 4.71911E+01 | 1.08179E-03 | 1.16520E-01 |
| STD | 1.83406E-04 | 8.33816E+00 | 1.97124E+05 | 5.06371E-06 | 1.06971E+00 | 3.43420E+03 | 1.43461E+02 | 9.54832E-03 | 2.62947E-01 |
| IQR | 6.55127E-06 | 2.28483E+00 | 3.15183E+03 | 5.42428E-06 | 1.52579E+00 | 1.85976E+03 | 1.87806E+02 | 1.05710E-03 | 2.96819E-01 |
| **MABC** |  |  |  |  |  |  |  |  |  |
| MEAN | 8.43696E-05 | 1.14305E+01 | 1.51025E+04 | 6.88795E-06 | 2.05296E+00 | 1.30822E+04 | 1.87992E+02 | 8.73693E-03 | 3.29820E-01 |
| MEDIAN | 1.39100E-06 | 9.93725E+00 | 3.91349E+02 | 6.47851E-06 | 1.84359E+00 | 1.27895E+04 | 1.13315E+02 | 1.53906E-03 | 3.53569E-01 |
| STD | 1.72156E-04 | 8.22054E+00 | 6.94018E+04 | 2.38962E-06 | 6.31622E-01 | 1.22683E+03 | 1.71735E+02 | 1.52181E-02 | 1.09211E-01 |
| IQR | 1.18894E-04 | 1.18583E+01 | 6.83317E+02 | 1.03384E-06 | 3.99133E-01 | 4.64595E+02 | 3.59388E+02 | 6.93289E-03 | 1.17934E-01 |
| **TLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.41354E-05 | 6.25434E+00 | 3.61536E+04 | 8.95928E-06 | 2.92201E+00 | 1.41739E+04 | 1.21722E+01 | 9.63674E-04 | 9.95042E-02 |
| MEDIAN | 1.49998E-05 | 6.37041E+00 | 1.00019E+04 | 8.96101E-06 | 2.92307E+00 | 1.41753E+04 | 1.00025E+01 | 9.59996E-04 | 9.95037E-02 |
| STD | 3.64271E-06 | 4.06928E-01 | 1.31353E+05 | 5.98003E-09 | 3.64405E-03 | 4.82182E+00 | 7.40580E+00 | 1.24785E-05 | 2.20001E-06 |
| IQR | 2.49391E-06 | 2.38776E-01 | 2.80094E+03 | 2.66597E-09 | 1.73634E-03 | 2.37254E+00 | 3.15653E+00 | 4.50969E-06 | 2.02140E-07 |
| **GOTLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.38343E-04 | 1.00611E+01 | 4.98093E+04 | 1.17919E-05 | 3.11751E+00 | 1.73665E+04 | 1.16759E+02 | 1.62579E-02 | 4.77176E-01 |
| MEDIAN | 5.37507E-06 | 7.28573E+00 | 4.15155E+02 | 9.57098E-06 | 2.85578E+00 | 1.36144E+04 | 1.29627E+01 | 2.67967E-03 | 3.90311E-01 |
| STD | 2.62287E-04 | 8.16600E+00 | 1.34161E+05 | 9.12450E-06 | 1.71413E+00 | 9.85001E+03 | 1.61999E+02 | 2.76955E-02 | 2.65655E-01 |
| IQR | 1.44051E-04 | 9.29239E+00 | 5.05273E+03 | 1.47588E-05 | 2.33102E+00 | 8.67457E+03 | 2.23950E+02 | 1.26027E-02 | 3.34857E-01 |
| **STLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.49795E-05 | 6.36854E+00 | 9.97536E+03 | 8.96098E-06 | 2.92306E+00 | 1.41753E+04 | 1.00339E+01 | 9.60039E-04 | 9.95037E-02 |
| MEDIAN | 1.49998E-05 | 6.37041E+00 | 1.00019E+04 | 8.96101E-06 | 2.92307E+00 | 1.41753E+04 | 1.00025E+01 | 9.59996E-04 | 9.95037E-02 |
| STD | 1.44843E-07 | 1.33906E-02 | 1.89741E+02 | 1.76253E-10 | 1.03160E-04 | 1.40774E-01 | 2.24315E-01 | 3.09387E-07 | 1.68034E-09 |
| IQR | 1.45000E-13 | 1.35000E-08 | 2.20000E-04 | 0.00000E+00 | 0.00000E+00 | 0.00000E+00 | 2.00000E-07 | 3.00000E-13 | 0.00000E+00 |
| **PSO** |  |  |  |  |  |  |  |  |  |
| MEAN | 4.96545E-04 | 1.91264E+01 | 4.50294E+05 | 6.73083E-06 | 3.11462E+00 | 1.44364E+04 | 2.73896E+02 | 4.28324E-02 | 3.72144E-01 |
| MEDIAN | 3.93736E-04 | 3.00000E+01 | 6.26289E+02 | 6.46051E-06 | 1.83190E+00 | 1.27767E+04 | 4.06458E+02 | 5.33325E-02 | 3.85700E-01 |
| STD | 4.91736E-04 | 1.25858E+01 | 5.01487E+05 | 7.61651E-06 | 5.71557E+00 | 9.27566E+03 | 2.51077E+02 | 3.94865E-02 | 2.22745E-01 |
| IQR | 1.00000E-03 | 2.45495E+01 | 9.99990E+05 | 7.18939E-06 | 2.05427E+00 | 2.47101E+03 | 4.96305E+02 | 6.45831E-02 | 1.50075E-01 |
| **IJAYA** |  |  |  |  |  |  |  |  |  |
| MEAN | 9.42349E-06 | 5.29024E+00 | 4.56409E+04 | 8.85416E-06 | 2.89893E+00 | 1.41009E+04 | 2.95165E+01 | 1.03031E-03 | 1.03602E-01 |
| MEDIAN | 4.06721E-06 | 4.99484E+00 | 2.15019E+03 | 8.96174E-06 | 2.92351E+00 | 1.41640E+04 | 2.09875E+01 | 1.03297E-03 | 9.97036E-02 |
| STD | 9.97079E-06 | 1.37877E+00 | 1.50209E+05 | 6.34878E-07 | 1.40577E-01 | 3.50896E+02 | 3.18446E+01 | 6.87619E-05 | 1.39971E-02 |
| IQR | 1.70485E-05 | 2.48413E+00 | 1.00581E+04 | 1.15569E-07 | 5.21455E-02 | 8.11628E+01 | 4.12794E+01 | 9.07897E-05 | 1.38672E-03 |
| **ISCA** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.14398E-04 | 1.13257E+01 | 4.95872E+04 | 1.32313E-05 | 4.09783E+00 | 1.71151E+04 | 4.73098E+01 | 1.38167E-02 | 8.18085E-01 |
| MEDIAN | 4.64450E-05 | 8.71622E+00 | 8.29500E+02 | 1.14849E-05 | 4.22265E+00 | 1.40675E+04 | 6.47950E+00 | 3.14781E-03 | 7.88469E-01 |
| STD | 2.85623E-04 | 7.27020E+00 | 1.37358E+05 | 1.04956E-05 | 2.02014E+00 | 1.02917E+04 | 9.73633E+01 | 2.06994E-02 | 3.51104E-01 |
| IQR | 3.31054E-04 | 1.15029E+01 | 2.90738E+04 | 1.70564E-05 | 3.35400E+00 | 1.04869E+04 | 2.36857E+01 | 1.53414E-02 | 5.49263E-01 |
| **NNA** |  |  |  |  |  |  |  |  |  |
| MEAN | 6.97328E-05 | 1.11960E+01 | 3.53652E+04 | 3.24448E-05 | 6.99158E+00 | 1.39565E+04 | 1.20903E+02 | 2.02108E-02 | 7.63030E-01 |
| MEDIAN | 4.83914E-07 | 5.40878E+00 | 2.85860E+02 | 7.14148E-06 | 4.64963E+00 | 8.24641E+03 | 8.38115E+00 | 7.48303E-03 | 7.72851E-01 |
| STD | 1.73519E-04 | 1.02970E+01 | 1.47089E+05 | 8.29188E-05 | 7.83605E+00 | 1.43488E+04 | 2.04252E+02 | 2.29392E-02 | 3.27747E-01 |
| IQR | 3.03647E-05 | 1.84023E+01 | 4.76218E+03 | 2.75607E-05 | 5.16022E+00 | 8.11209E+03 | 1.42647E+02 | 2.78367E-02 | 4.84035E-01 |
| **CWOA** |  |  |  |  |  |  |  |  |  |
| MEAN | 4.49032E-04 | 1.44168E+01 | 1.85295E+05 | 2.74796E-04 | 9.56700E+00 | 2.60700E+04 | 1.87729E+02 | 2.08770E-02 | 5.30129E-01 |
| MEDIAN | 4.09507E-05 | 8.93518E+00 | 5.11516E+02 | 1.47994E-05 | 5.62832E+00 | 1.43077E+04 | 2.18000E+01 | 5.06958E-03 | 4.31416E-01 |
| STD | 4.90289E-04 | 1.06173E+01 | 3.68325E+05 | 1.40060E-03 | 9.90648E+00 | 1.93858E+04 | 2.42860E+02 | 3.19845E-02 | 2.44593E-01 |
| IQR | 9.99991E-04 | 2.02686E+01 | 3.31672E+04 | 2.48264E-05 | 1.35909E+01 | 3.90139E+04 | 3.84579E+02 | 1.75534E-02 | 3.97857E-01 |
| **WW** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.20155E-04 | 1.11588E+01 | 4.54647E+04 | 1.39193E-05 | 3.35375E+00 | 1.85707E+04 | 1.43130E+02 | 1.81508E-02 | 4.63896E-01 |
| MEDIAN | 1.26821E-05 | 7.49752E+00 | 3.58915E+02 | 7.11711E-06 | 1.90408E+00 | 1.19046E+04 | 4.99410E+01 | 4.23071E-03 | 4.19885E-01 |
| STD | 3.27795E-04 | 8.79605E+00 | 1.95860E+05 | 2.06209E-05 | 3.08596E+00 | 1.40779E+04 | 1.64633E+02 | 2.56551E-02 | 2.32534E-01 |
| IQR | 4.03710E-04 | 1.07669E+01 | 1.11765E+03 | 1.81979E-05 | 3.84336E+00 | 8.32636E+03 | 2.54327E+02 | 2.11628E-02 | 3.14131E-01 |
|  |  |  |  |  | ***T* = 270 K** |  |  |  |  |
| true value | 1.50000E-05 | 6.13450E+00 | 1.00000E+04 | 1.73488E-05 | 2.85185E+00 | 8.35610E+03 | 2.00000E+01 | 9.70000E-04 | 5.55000E+02 |
| **DE** |  |  |  |  |  |  |  |  |  |
| MEAN | 3.97827E-05 | 6.46318E+00 | 1.47957E+04 | 1.60419E-05 | 2.40776E+00 | 8.07538E+03 | 7.98556E+01 | 1.14786E-03 | 2.22913E-01 |
| MEDIAN | 5.77314E-06 | 5.29869E+00 | 2.38569E+03 | 1.56412E-05 | 2.38705E+00 | 7.93938E+03 | 4.24117E+01 | 1.09825E-03 | 1.94071E-01 |
| STD | 1.11777E-04 | 4.47231E+00 | 6.33642E+04 | 4.08053E-06 | 5.99120E-01 | 9.05848E+02 | 8.63818E+01 | 1.81649E-04 | 9.77005E-02 |
| IQR | 2.76233E-05 | 4.99615E+00 | 5.31820E+03 | 5.17515E-06 | 8.98643E-01 | 1.07949E+03 | 1.04027E+02 | 2.48342E-04 | 1.54062E-01 |
| **EBLSHADE** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.20138E-05 | 4.98071E+00 | 3.38125E+04 | 1.57012E-05 | 2.47307E+00 | 8.03848E+03 | 1.04170E+02 | 1.73934E-03 | 1.36977E-01 |
| MEDIAN | 1.01808E-05 | 5.66058E+00 | 7.25031E+03 | 1.71043E-05 | 2.73316E+00 | 8.29864E+03 | 6.89136E+01 | 9.73795E-04 | 1.01068E-01 |
| STD | 1.60470E-05 | 1.92840E+00 | 1.12391E+05 | 2.60446E-06 | 4.99355E-01 | 4.76023E+02 | 1.05545E+02 | 4.74130E-03 | 7.59595E-02 |
| IQR | 1.46272E-05 | 2.85879E+00 | 8.20152E+03 | 4.16504E-06 | 8.06062E-01 | 7.87928E+02 | 1.38323E+02 | 1.21335E-04 | 4.13082E-02 |
| **ADELI** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.50038E-05 | 6.13482E+00 | 1.00067E+04 | 1.73488E-05 | 2.85185E+00 | 8.35610E+03 | 1.99953E+01 | 9.69990E-04 | 9.95037E-02 |
| MEDIAN | 1.50041E-05 | 6.13485E+00 | 1.00072E+04 | 1.73488E-05 | 2.85185E+00 | 8.35610E+03 | 1.99947E+01 | 9.69989E-04 | 9.95037E-02 |
| STD | 2.58165E-09 | 2.27269E-04 | 3.34077E+00 | 5.03827E-12 | 2.93864E-06 | 2.37866E-03 | 4.38562E-03 | 4.30177E-09 | 2.80056E-12 |
| IQR | 1.15000E-13 | 9.50000E-09 | 1.65000E-04 | 0.00000E+00 | 0.00000E+00 | 0.00000E+00 | 1.45000E-07 | 2.00000E-13 | 0.00000E+00 |
| **NDE** |  |  |  |  |  |  |  |  |  |
| MEAN | 3.60465E-05 | 7.52609E+00 | 4.39246E+04 | 1.72948E-05 | 2.78308E+00 | 8.80209E+03 | 1.01459E+02 | 4.81775E-03 | 3.23871E-01 |
| MEDIAN | 7.62416E-06 | 5.53708E+00 | 4.46543E+03 | 1.73249E-05 | 2.84084E+00 | 8.34608E+03 | 4.09988E+01 | 9.94233E-04 | 9.95174E-02 |
| STD | 1.37707E-04 | 6.43194E+00 | 1.86180E+05 | 1.10173E-05 | 1.24892E+00 | 3.93863E+03 | 1.23126E+02 | 1.04508E-02 | 3.19557E-01 |
| IQR | 1.01408E-05 | 1.26505E+00 | 6.36841E+03 | 3.40922E-07 | 3.80923E-01 | 3.04136E+02 | 7.78842E+01 | 1.56030E-03 | 4.32743E-01 |
| **MABC** |  |  |  |  |  |  |  |  |  |
| MEAN | 8.35160E-05 | 1.13300E+01 | 1.90230E+03 | 1.52458E-05 | 1.83437E+00 | 8.14462E+03 | 1.71108E+02 | 6.46840E-03 | 4.09273E-01 |
| MEDIAN | 2.71136E-06 | 6.75135E+00 | 4.44996E+02 | 1.28359E-05 | 1.49147E+00 | 7.32573E+03 | 1.10384E+02 | 1.51852E-03 | 4.53471E-01 |
| STD | 1.77793E-04 | 8.72640E+00 | 6.86129E+03 | 8.14470E-06 | 8.54012E-01 | 2.87251E+03 | 1.63207E+02 | 1.15945E-02 | 1.19907E-01 |
| IQR | 3.74323E-05 | 1.16597E+01 | 4.56164E+02 | 3.63794E-06 | 8.02846E-01 | 7.22304E+02 | 2.89850E+02 | 1.58740E-03 | 1.09724E-01 |
| **TLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 3.42920E-05 | 6.14136E+00 | 1.03102E+04 | 1.72507E-05 | 2.82232E+00 | 8.33313E+03 | 2.88516E+01 | 2.91144E-03 | 1.06683E-01 |
| MEDIAN | 1.50041E-05 | 6.13485E+00 | 1.00072E+04 | 1.73488E-05 | 2.85185E+00 | 8.35610E+03 | 1.99947E+01 | 9.69989E-04 | 9.95037E-02 |
| STD | 1.37902E-04 | 1.08243E-01 | 5.07984E+03 | 6.99104E-07 | 2.10329E-01 | 1.63655E+02 | 6.26792E+01 | 1.38641E-02 | 5.12710E-02 |
| IQR | 1.65000E-13 | 1.45000E-08 | 2.10000E-04 | 0.00000E+00 | 0.00000E+00 | 0.00000E+00 | 2.80000E-07 | 3.00000E-13 | 0.00000E+00 |
| **GOTLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.21297E-04 | 1.02327E+01 | 5.82929E+04 | 2.63430E-05 | 3.18704E+00 | 1.50645E+04 | 1.82996E+02 | 1.79608E-02 | 5.37131E-01 |
| MEDIAN | 4.36767E-05 | 7.24878E+00 | 6.00680E+02 | 1.74105E-05 | 2.17765E+00 | 7.65899E+03 | 3.58986E+01 | 3.30988E-03 | 4.68831E-01 |
| STD | 3.29794E-04 | 7.75064E+00 | 1.71753E+05 | 2.14681E-05 | 2.49472E+00 | 1.31466E+04 | 2.04525E+02 | 2.51704E-02 | 2.56434E-01 |
| IQR | 3.04017E-04 | 1.37737E+01 | 1.12995E+04 | 3.81661E-05 | 4.72482E+00 | 1.19406E+04 | 3.96259E+02 | 2.55133E-02 | 3.08822E-01 |
| **STLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.50041E-05 | 6.13485E+00 | 1.00072E+04 | 1.73488E-05 | 2.85185E+00 | 8.35610E+03 | 1.99947E+01 | 9.69989E-04 | 9.95037E-02 |
| MEDIAN | 1.50041E-05 | 6.13485E+00 | 1.00072E+04 | 1.73488E-05 | 2.85185E+00 | 8.35610E+03 | 1.99947E+01 | 9.69989E-04 | 9.95037E-02 |
| STD | 7.11701E-14 | 6.30226E-09 | 9.65869E-05 | 1.02655E-20 | 4.48508E-16 | 9.18545E-12 | 1.22443E-07 | 1.29342E-13 | 0.00000E+00 |
| IQR | 1.00000E-13 | 9.00000E-09 | 1.25000E-04 | 0.00000E+00 | 0.00000E+00 | 0.00000E+00 | 1.85000E-07 | 1.50000E-13 | 0.00000E+00 |
| **PSO** |  |  |  |  |  |  |  |  |  |
| MEAN | 5.42121E-04 | 1.73060E+01 | 4.04042E+05 | 2.21554E-04 | 1.81735E+00 | 1.15906E+04 | 3.66525E+02 | 5.55091E-02 | 4.57577E-01 |
| MEDIAN | 7.65571E-04 | 1.03874E+01 | 5.01498E+01 | 1.23559E-05 | 1.34967E+00 | 7.18728E+03 | 4.67262E+02 | 5.94252E-02 | 4.65652E-01 |
| STD | 4.73026E-04 | 1.25113E+01 | 4.90627E+05 | 1.39832E-03 | 1.84670E+00 | 1.42994E+04 | 2.48536E+02 | 4.03759E-02 | 1.56622E-01 |
| IQR | 1.00000E-03 | 2.44417E+01 | 9.99990E+05 | 7.56079E-06 | 1.03118E+00 | 8.23241E+02 | 3.67990E+02 | 9.82999E-02 | 8.89681E-02 |
| **IJAYA** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.34436E-05 | 5.56862E+00 | 7.06023E+04 | 1.72620E-05 | 2.85474E+00 | 8.33257E+03 | 2.57141E+01 | 1.01548E-03 | 1.04705E-01 |
| MEDIAN | 8.14670E-06 | 5.43119E+00 | 3.84502E+03 | 1.73289E-05 | 2.85875E+00 | 8.35131E+03 | 5.99943E+00 | 9.95066E-04 | 9.97465E-02 |
| STD | 1.27047E-05 | 1.41515E+00 | 1.75091E+05 | 8.14931E-07 | 1.31050E-01 | 1.78679E+02 | 3.22800E+01 | 9.14166E-05 | 2.34925E-02 |
| IQR | 2.05442E-05 | 2.30946E+00 | 2.69783E+04 | 2.64758E-07 | 8.27546E-02 | 7.15931E+01 | 4.59218E+01 | 6.75688E-05 | 6.59079E-04 |
| **ISCA** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.28542E-04 | 8.84677E+00 | 5.20611E+04 | 3.69271E-05 | 5.46702E+00 | 1.50917E+04 | 6.69038E+01 | 1.61026E-02 | 7.96817E-01 |
| MEDIAN | 6.51884E-05 | 7.58798E+00 | 1.83515E+03 | 3.69600E-05 | 5.95693E+00 | 1.01392E+04 | 2.54027E+01 | 5.61353E-03 | 7.96935E-01 |
| STD | 2.94528E-04 | 5.73257E+00 | 1.37975E+05 | 2.35718E-05 | 2.67474E+00 | 1.14491E+04 | 1.03287E+02 | 2.05783E-02 | 3.65124E-01 |
| IQR | 3.44632E-04 | 5.30328E+00 | 2.35572E+04 | 4.36206E-05 | 4.77947E+00 | 1.34149E+04 | 9.05064E+01 | 2.15636E-02 | 6.73399E-01 |
| **NNA** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.33163E-04 | 1.18191E+01 | 1.34310E+05 | 3.42653E-05 | 7.99323E+00 | 8.49075E+03 | 1.34474E+02 | 2.18238E-02 | 6.45683E-01 |
| MEDIAN | 1.80058E-06 | 9.75274E+00 | 3.66720E+02 | 9.51081E-06 | 5.34996E+00 | 3.74761E+03 | 4.70315E+00 | 7.83039E-03 | 6.02627E-01 |
| STD | 2.67511E-04 | 8.74011E+00 | 2.82548E+05 | 7.36358E-05 | 8.15039E+00 | 1.25501E+04 | 2.14004E+02 | 2.78684E-02 | 3.64232E-01 |
| IQR | 1.21611E-04 | 1.40399E+01 | 7.06111E+04 | 3.55724E-05 | 8.30687E+00 | 5.76668E+03 | 2.43160E+02 | 2.34230E-02 | 4.50381E-01 |
| **CWOA** |  |  |  |  |  |  |  |  |  |
| MEAN | 3.93696E-04 | 1.55911E+01 | 1.09481E+05 | 6.65485E-04 | 9.65336E+00 | 2.68805E+04 | 1.94785E+02 | 2.85699E-02 | 6.35434E-01 |
| MEDIAN | 4.35791E-07 | 1.54541E+01 | 2.42849E+02 | 5.98460E-05 | 6.62586E+00 | 1.70441E+04 | 1.40753E+01 | 1.75843E-02 | 6.05750E-01 |
| STD | 4.77009E-04 | 1.16298E+01 | 2.88059E+05 | 2.36125E-03 | 9.53654E+00 | 2.20374E+04 | 2.58012E+02 | 3.27865E-02 | 2.98087E-01 |
| IQR | 1.00000E-03 | 2.47268E+01 | 1.68690E+03 | 5.32964E-05 | 6.52389E+00 | 4.28198E+04 | 3.88437E+02 | 4.24920E-02 | 3.42745E-01 |
| **WW** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.16269E-04 | 9.40052E+00 | 5.15084E+03 | 2.29466E-05 | 3.64496E+00 | 1.32663E+04 | 1.65863E+02 | 2.69972E-02 | 7.00965E-01 |
| MEDIAN | 9.75714E-06 | 7.18348E+00 | 1.81856E+02 | 1.20356E-05 | 3.41832E+00 | 6.57734E+03 | 1.20930E+02 | 1.17396E-02 | 7.09785E-01 |
| STD | 3.51729E-04 | 7.77397E+00 | 1.77662E+04 | 2.79248E-05 | 2.69874E+00 | 1.44664E+04 | 1.70058E+02 | 3.05017E-02 | 2.85715E-01 |
| IQR | 2.91627E-04 | 9.53794E+00 | 9.84394E+02 | 3.08470E-05 | 3.24640E+00 | 6.24479E+03 | 1.93044E+02 | 4.65641E-02 | 5.01708E-01 |
|  |  |  |  |  | ***T* = 280 K** |  |  |  |  |
| true value | 1.50000E-05 | 5.91541E+00 | 1.00000E+04 | 3.20396E-05 | 2.78571E+00 | 5.11528E+03 | 3.00000E+01 | 9.80000E-04 | 5.55000E+02 |
| **DE** |  |  |  |  |  |  |  |  |  |
| MEAN | 4.03971E-05 | 6.47375E+00 | 3.43403E+04 | 3.19652E-05 | 2.43732E+00 | 5.16621E+03 | 7.48714E+01 | 1.16245E-03 | 2.69919E-01 |
| MEDIAN | 1.05665E-05 | 5.55661E+00 | 2.33187E+03 | 3.00393E-05 | 2.24036E+00 | 4.86298E+03 | 3.35295E+01 | 1.11319E-03 | 2.40187E-01 |
| STD | 7.82385E-05 | 3.76377E+00 | 1.02886E+05 | 1.19898E-05 | 9.93911E-01 | 1.35207E+03 | 8.65413E+01 | 2.04066E-04 | 1.41998E-01 |
| IQR | 3.80577E-05 | 4.53467E+00 | 7.58220E+03 | 1.19566E-05 | 1.26054E+00 | 9.83531E+02 | 1.22586E+02 | 2.28513E-04 | 2.65492E-01 |
| **EBLSHADE** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.18545E-05 | 5.14036E+00 | 8.00183E+03 | 3.04040E-05 | 2.56009E+00 | 4.98407E+03 | 7.10561E+01 | 1.03308E-03 | 1.22161E-01 |
| MEDIAN | 1.50050E-05 | 5.91584E+00 | 9.18706E+03 | 3.20374E-05 | 2.78327E+00 | 5.11486E+03 | 2.99905E+01 | 9.80532E-04 | 9.95039E-02 |
| STD | 1.20503E-05 | 1.57676E+00 | 1.06627E+04 | 3.89328E-06 | 4.69538E-01 | 2.80340E+02 | 7.51483E+01 | 1.06631E-04 | 5.98735E-02 |
| IQR | 1.34067E-05 | 2.02795E+00 | 7.81235E+03 | 2.27881E-06 | 2.81145E-01 | 2.05100E+02 | 7.09991E+01 | 6.26323E-05 | 5.74356E-03 |
| **ADELI** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.50050E-05 | 5.91584E+00 | 1.00056E+04 | 3.20396E-05 | 2.78572E+00 | 5.11528E+03 | 2.99905E+01 | 9.79994E-04 | 9.95037E-02 |
| MEDIAN | 1.50050E-05 | 5.91584E+00 | 1.00056E+04 | 3.20396E-05 | 2.78572E+00 | 5.11528E+03 | 2.99905E+01 | 9.79994E-04 | 9.95037E-02 |
| STD | 4.68791E-14 | 4.08594E-09 | 5.84150E-05 | 4.15390E-15 | 1.96039E-10 | 1.96039E-07 | 9.17494E-08 | 7.99019E-14 | 0.00000E+00 |
| IQR | 6.50000E-14 | 6.00000E-09 | 8.50000E-05 | 0.00000E+00 | 0.00000E+00 | 0.00000E+00 | 1.25000E-07 | 1.50000E-13 | 0.00000E+00 |
| **NDE** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.77117E-05 | 8.69583E+00 | 5.56285E+04 | 5.33777E-05 | 3.87503E+00 | 1.31572E+04 | 8.64157E+01 | 3.21307E-03 | 4.11828E-01 |
| MEDIAN | 1.05499E-05 | 5.72903E+00 | 4.33185E+03 | 3.20377E-05 | 2.78288E+00 | 5.11362E+03 | 3.69645E+01 | 1.01834E-03 | 1.01189E-01 |
| STD | 8.06873E-05 | 7.83219E+00 | 1.96568E+05 | 3.96424E-05 | 2.47164E+00 | 1.51291E+04 | 9.27014E+01 | 6.11367E-03 | 3.61927E-01 |
| IQR | 1.36463E-05 | 2.84525E+00 | 8.39135E+03 | 5.06552E-05 | 1.58487E+00 | 9.24994E+03 | 8.21456E+01 | 1.12110E-03 | 6.09675E-01 |
| **MABC** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.05079E-04 | 9.48064E+00 | 1.00918E+04 | 3.74310E-05 | 2.17608E+00 | 7.21156E+03 | 2.01627E+02 | 9.75615E-03 | 4.43772E-01 |
| MEDIAN | 8.08438E-06 | 5.85840E+00 | 4.74797E+02 | 2.57093E-05 | 1.36866E+00 | 4.37556E+03 | 1.47165E+02 | 1.52239E-03 | 5.30317E-01 |
| STD | 2.37915E-04 | 7.78150E+00 | 4.30445E+04 | 2.39975E-05 | 1.76970E+00 | 7.87100E+03 | 1.93659E+02 | 1.67765E-02 | 1.98345E-01 |
| IQR | 3.18799E-05 | 1.00038E+01 | 1.25100E+03 | 1.56437E-05 | 2.30682E+00 | 1.44114E+03 | 3.72880E+02 | 5.68043E-03 | 3.13886E-01 |
| **TLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.57491E-05 | 5.96851E+00 | 5.39360E+04 | 3.20421E-05 | 2.78672E+00 | 5.11587E+03 | 2.89571E+01 | 9.79193E-04 | 9.95041E-02 |
| MEDIAN | 1.50050E-05 | 5.91584E+00 | 1.00056E+04 | 3.20396E-05 | 2.78572E+00 | 5.11528E+03 | 2.99905E+01 | 9.79994E-04 | 9.95037E-02 |
| STD | 2.73367E-06 | 2.03931E-01 | 1.90143E+05 | 1.22930E-08 | 4.46177E-03 | 2.55500E+00 | 4.17713E+00 | 3.26380E-06 | 1.12462E-06 |
| IQR | 1.35000E-13 | 1.10000E-08 | 1.70000E-04 | 1.00000E-14 | 0.00000E+00 | 0.00000E+00 | 2.45000E-07 | 2.00000E-13 | 0.00000E+00 |
| **GOTLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.33014E-04 | 9.91098E+00 | 1.75797E+04 | 6.13097E-05 | 4.42251E+00 | 1.28409E+04 | 1.39907E+02 | 1.96162E-02 | 7.08323E-01 |
| MEDIAN | 2.95516E-06 | 6.77589E+00 | 3.38128E+02 | 6.45502E-05 | 3.81116E+00 | 7.51306E+03 | 2.34557E+01 | 2.75168E-03 | 6.79184E-01 |
| STD | 2.77360E-04 | 7.83704E+00 | 5.05155E+04 | 3.90846E-05 | 3.18270E+00 | 1.30797E+04 | 1.77222E+02 | 2.83219E-02 | 2.64995E-01 |
| IQR | 7.16887E-05 | 1.22921E+01 | 1.49611E+03 | 7.08709E-05 | 5.29957E+00 | 1.13359E+04 | 2.57643E+02 | 2.71988E-02 | 3.56115E-01 |
| **STLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.50050E-05 | 5.91584E+00 | 1.00056E+04 | 3.20396E-05 | 2.78572E+00 | 5.11528E+03 | 2.99905E+01 | 9.79994E-04 | 9.95037E-02 |
| MEDIAN | 1.50050E-05 | 5.91584E+00 | 1.00056E+04 | 3.20396E-05 | 2.78572E+00 | 5.11528E+03 | 2.99905E+01 | 9.79994E-04 | 9.95037E-02 |
| STD | 6.79313E-14 | 5.71795E-09 | 8.35703E-05 | 4.28403E-15 | 1.96039E-10 | 2.37635E-07 | 1.24334E-07 | 1.13863E-13 | 0.00000E+00 |
| IQR | 1.10000E-13 | 9.00000E-09 | 1.35000E-04 | 4.99999E-15 | 0.00000E+00 | 0.00000E+00 | 2.25000E-07 | 2.00000E-13 | 0.00000E+00 |
| **PSO** |  |  |  |  |  |  |  |  |  |
| MEAN | 4.90580E-04 | 1.76613E+01 | 4.91086E+05 | 4.20596E-05 | 2.29212E+00 | 9.41958E+03 | 2.84719E+02 | 3.41257E-02 | 4.34537E-01 |
| MEDIAN | 3.74885E-04 | 1.53835E+01 | 2.13639E+04 | 2.38043E-05 | 8.18861E-01 | 4.11017E+03 | 3.23952E+02 | 2.60703E-03 | 5.18227E-01 |
| STD | 4.72548E-04 | 1.22030E+01 | 5.03958E+05 | 7.40977E-05 | 4.49178E+00 | 1.49906E+04 | 2.64010E+02 | 3.85989E-02 | 2.10950E-01 |
| IQR | 1.00000E-03 | 2.37458E+01 | 9.99990E+05 | 7.19490E-06 | 1.32207E+00 | 4.12745E+02 | 5.18089E+02 | 6.16710E-02 | 2.58364E-01 |
| **IJAYA** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.19277E-05 | 5.45879E+00 | 1.63419E+04 | 3.23995E-05 | 2.84490E+00 | 5.15540E+03 | 2.64533E+01 | 1.00538E-03 | 1.00681E-01 |
| MEDIAN | 9.05189E-06 | 5.39475E+00 | 4.01672E+03 | 3.23243E-05 | 2.84374E+00 | 5.14506E+03 | 2.20458E+01 | 1.00048E-03 | 9.96693E-02 |
| STD | 8.87445E-06 | 9.19306E-01 | 3.71416E+04 | 9.63524E-07 | 1.17815E-01 | 8.07806E+01 | 2.35787E+01 | 2.82317E-05 | 2.17705E-03 |
| IQR | 1.17422E-05 | 1.28966E+00 | 4.70664E+03 | 7.86839E-07 | 1.18051E-01 | 8.54310E+01 | 4.03945E+01 | 3.36021E-05 | 9.82662E-04 |
| **ISCA** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.83766E-04 | 9.86647E+00 | 4.69925E+04 | 7.03646E-05 | 6.07375E+00 | 1.25942E+04 | 5.42215E+01 | 1.47866E-02 | 8.75664E-01 |
| MEDIAN | 5.47205E-05 | 8.41675E+00 | 7.75965E+02 | 6.50218E-05 | 6.57588E+00 | 8.94831E+03 | 8.57698E+00 | 4.47212E-03 | 8.50597E-01 |
| STD | 2.51264E-04 | 6.52144E+00 | 9.88665E+04 | 5.30048E-05 | 3.61334E+00 | 1.15304E+04 | 9.58071E+01 | 2.33692E-02 | 3.68388E-01 |
| IQR | 2.53087E-04 | 8.90420E+00 | 2.90583E+04 | 9.40261E-05 | 6.41914E+00 | 1.18267E+04 | 5.34118E+01 | 1.22838E-02 | 4.41164E-01 |
| **NNA** |  |  |  |  |  |  |  |  |  |
| MEAN | 8.78895E-05 | 1.14990E+01 | 2.67358E+04 | 9.98624E-05 | 9.76851E+00 | 7.62042E+03 | 8.55876E+01 | 1.72191E-02 | 6.43180E-01 |
| MEDIAN | 8.59411E-07 | 6.50432E+00 | 3.25105E+02 | 1.66778E-05 | 4.73042E+00 | 3.19642E+03 | 1.17920E+01 | 7.07644E-03 | 3.43187E-01 |
| STD | 2.21259E-04 | 1.01545E+01 | 9.73571E+04 | 1.79068E-04 | 9.59993E+00 | 1.23248E+04 | 1.37935E+02 | 2.05363E-02 | 4.44218E-01 |
| IQR | 2.08350E-05 | 1.55855E+01 | 1.79409E+03 | 1.03583E-04 | 1.19909E+01 | 2.63282E+03 | 9.10212E+01 | 1.87243E-02 | 7.10095E-01 |
| **CWOA** |  |  |  |  |  |  |  |  |  |
| MEAN | 3.85449E-04 | 1.39379E+01 | 2.70838E+05 | 8.46368E-04 | 9.62326E+00 | 1.74583E+04 | 2.02366E+02 | 2.14748E-02 | 5.27628E-01 |
| MEDIAN | 2.19171E-06 | 8.88450E+00 | 1.00137E+03 | 3.09983E-05 | 5.84803E+00 | 4.23165E+03 | 1.00462E+02 | 4.83641E-03 | 4.81295E-01 |
| STD | 4.74388E-04 | 1.12526E+01 | 4.19853E+05 | 2.68209E-03 | 9.67793E+00 | 2.13337E+04 | 2.37390E+02 | 3.15758E-02 | 3.13645E-01 |
| IQR | 1.00000E-03 | 2.48353E+01 | 4.37554E+05 | 1.03505E-04 | 1.37793E+01 | 4.70393E+04 | 3.85010E+02 | 2.62552E-02 | 3.94971E-01 |
| **WW** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.44647E-04 | 8.49699E+00 | 2.25207E+04 | 8.06690E-05 | 5.87753E+00 | 1.55260E+04 | 1.21233E+02 | 2.13644E-02 | 7.02521E-01 |
| MEDIAN | 2.07544E-05 | 5.55207E+00 | 3.49887E+02 | 2.88009E-05 | 3.97374E+00 | 4.18031E+03 | 3.14306E+01 | 1.25676E-02 | 6.55868E-01 |
| STD | 2.67028E-04 | 7.05764E+00 | 1.39847E+05 | 1.26299E-04 | 6.35493E+00 | 1.97252E+04 | 1.69308E+02 | 2.68815E-02 | 3.07217E-01 |
| IQR | 1.14146E-04 | 6.32558E+00 | 1.55561E+03 | 9.78762E-05 | 7.21343E+00 | 1.76767E+04 | 1.56014E+02 | 2.90273E-02 | 4.14570E-01 |
|  |  |  |  |  | ***T* = 290 K** |  |  |  |  |
| true value | 1.50000E-05 | 5.71143E+00 | 1.00000E+04 | 5.67193E-05 | 2.72414E+00 | 3.23917E+03 | 4.00000E+01 | 9.90000E-04 | 5.55000E+02 |
| **DE** |  |  |  |  |  |  |  |  |  |
| MEAN | 3.46159E-05 | 6.09216E+00 | 2.19158E+04 | 6.71648E-05 | 2.50783E+00 | 4.83207E+03 | 8.12931E+01 | 1.90810E-03 | 3.32500E-01 |
| MEDIAN | 6.48195E-06 | 5.11255E+00 | 1.13697E+03 | 5.54289E-05 | 1.99172E+00 | 3.10085E+03 | 3.25107E+01 | 1.15795E-03 | 3.30132E-01 |
| STD | 7.76808E-05 | 3.80964E+00 | 9.53276E+04 | 3.25963E-05 | 1.60899E+00 | 7.24854E+03 | 1.03942E+02 | 5.16092E-03 | 1.65294E-01 |
| IQR | 1.83053E-05 | 3.87415E+00 | 2.30838E+03 | 2.73442E-05 | 1.84917E+00 | 9.81403E+02 | 1.28220E+02 | 1.95082E-04 | 2.54569E-01 |
| **EBLSHADE** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.30826E-05 | 4.85036E+00 | 1.48021E+04 | 5.33603E-05 | 2.40127E+00 | 3.10172E+03 | 8.61806E+01 | 1.05495E-03 | 1.38395E-01 |
| MEDIAN | 1.39459E-05 | 5.62019E+00 | 5.60258E+03 | 5.66979E-05 | 2.71612E+00 | 3.23758E+03 | 4.22780E+01 | 9.99182E-04 | 9.97064E-02 |
| STD | 2.41108E-05 | 2.18769E+00 | 4.26434E+04 | 6.94163E-06 | 5.83161E-01 | 2.39924E+02 | 8.03303E+01 | 8.83941E-05 | 9.92945E-02 |
| IQR | 1.44295E-05 | 2.39489E+00 | 8.52726E+03 | 6.87811E-06 | 5.03367E-01 | 2.53025E+02 | 7.17242E+01 | 1.17236E-04 | 1.23223E-02 |
| **ADELI** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.50007E-05 | 5.71149E+00 | 1.00012E+04 | 5.67193E-05 | 2.72414E+00 | 3.23917E+03 | 3.99991E+01 | 9.89998E-04 | 9.95037E-02 |
| MEDIAN | 1.50007E-05 | 5.71149E+00 | 1.00012E+04 | 5.67193E-05 | 2.72414E+00 | 3.23917E+03 | 3.99991E+01 | 9.89998E-04 | 9.95037E-02 |
| STD | 3.39977E-14 | 2.89381E-09 | 3.79566E-05 | 4.40143E-15 | 3.25396E-10 | 3.21491E-12 | 7.17403E-08 | 5.82759E-14 | 0.00000E+00 |
| IQR | 4.50000E-14 | 4.50000E-09 | 5.00000E-05 | 5.00000E-15 | 0.00000E+00 | 0.00000E+00 | 1.10000E-07 | 1.00000E-13 | 0.00000E+00 |
| **NDE** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.58693E-05 | 5.93582E+00 | 3.26967E+04 | 9.19756E-05 | 4.06791E+00 | 9.83853E+03 | 8.59774E+01 | 4.75296E-03 | 3.98666E-01 |
| MEDIAN | 1.02402E-05 | 5.51328E+00 | 7.23087E+03 | 5.67175E-05 | 2.72357E+00 | 3.23868E+03 | 4.09017E+01 | 1.00029E-03 | 1.02070E-01 |
| STD | 5.46032E-05 | 4.99782E+00 | 1.43416E+05 | 8.80024E-05 | 3.93737E+00 | 1.44569E+04 | 1.06084E+02 | 1.20467E-02 | 3.66697E-01 |
| IQR | 1.44796E-05 | 1.81800E+00 | 9.63269E+03 | 4.18079E-05 | 9.82699E-01 | 2.05120E+03 | 3.58207E+01 | 1.54216E-03 | 5.76480E-01 |
| **MABC** |  |  |  |  |  |  |  |  |  |
| MEAN | 7.01581E-05 | 1.07377E+01 | 7.75671E+03 | 7.08918E-05 | 2.18311E+00 | 4.67703E+03 | 1.36832E+02 | 3.57349E-03 | 4.84575E-01 |
| MEDIAN | 1.15925E-05 | 7.28004E+00 | 6.40583E+02 | 5.04565E-05 | 1.19481E+00 | 2.71026E+03 | 3.48521E+01 | 1.18108E-03 | 5.20898E-01 |
| STD | 1.56622E-04 | 8.52624E+00 | 2.91632E+04 | 5.91263E-05 | 2.99809E+00 | 6.50252E+03 | 1.59505E+02 | 7.09046E-03 | 2.25041E-01 |
| IQR | 7.31985E-05 | 1.12969E+01 | 9.98146E+02 | 3.85287E-05 | 2.23323E+00 | 1.51067E+03 | 2.31349E+02 | 1.38120E-03 | 3.80873E-01 |
| **TLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.54137E-05 | 5.73941E+00 | 2.55179E+04 | 5.67237E-05 | 2.72523E+00 | 3.23963E+03 | 3.93612E+01 | 9.89632E-04 | 9.95041E-02 |
| MEDIAN | 1.50007E-05 | 5.71149E+00 | 1.00012E+04 | 5.67193E-05 | 2.72414E+00 | 3.23917E+03 | 3.99991E+01 | 9.89998E-04 | 9.95037E-02 |
| STD | 2.18704E-06 | 1.57524E-01 | 1.00694E+05 | 1.88543E-08 | 6.14267E-03 | 2.47913E+00 | 3.69459E+00 | 2.23989E-06 | 1.70469E-06 |
| IQR | 5.50000E-14 | 5.00000E-09 | 6.00000E-05 | 1.00000E-14 | 1.00000E-09 | 0.00000E+00 | 1.45000E-07 | 1.00000E-13 | 0.00000E+00 |
| **GOTLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.66251E-04 | 1.09387E+01 | 1.30215E+04 | 1.26431E-04 | 5.70596E+00 | 1.15678E+04 | 1.21993E+02 | 1.80467E-02 | 7.97421E-01 |
| MEDIAN | 2.96412E-05 | 6.50236E+00 | 5.39677E+02 | 1.20935E-04 | 4.70210E+00 | 5.70257E+03 | 2.35265E+01 | 4.30726E-03 | 8.63220E-01 |
| STD | 2.69063E-04 | 8.93296E+00 | 3.44522E+04 | 8.21815E-05 | 4.62093E+00 | 1.38655E+04 | 1.78454E+02 | 2.60908E-02 | 2.69993E-01 |
| IQR | 2.53190E-04 | 1.52243E+01 | 2.25961E+03 | 1.49658E-04 | 8.61052E+00 | 8.73759E+03 | 1.66739E+02 | 2.42244E-02 | 3.11135E-01 |
| **STLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.50007E-05 | 5.71149E+00 | 1.00012E+04 | 5.67193E-05 | 2.72414E+00 | 3.23917E+03 | 3.99991E+01 | 9.89998E-04 | 9.95037E-02 |
| MEDIAN | 1.50007E-05 | 5.71149E+00 | 1.00012E+04 | 5.67193E-05 | 2.72414E+00 | 3.23917E+03 | 3.99991E+01 | 9.89998E-04 | 9.95037E-02 |
| STD | 4.68347E-14 | 3.89338E-09 | 5.26118E-05 | 4.40143E-15 | 3.47540E-10 | 3.21491E-12 | 1.00269E-07 | 6.72718E-14 | 0.00000E+00 |
| IQR | 7.50000E-14 | 6.00000E-09 | 7.00000E-05 | 5.00000E-15 | 0.00000E+00 | 0.00000E+00 | 1.60000E-07 | 1.00000E-13 | 0.00000E+00 |
| **PSO** |  |  |  |  |  |  |  |  |  |
| MEAN | 5.51686E-04 | 1.67256E+01 | 3.70327E+05 | 1.20269E-04 | 2.71825E+00 | 9.83965E+03 | 3.16996E+02 | 4.33233E-02 | 5.35518E-01 |
| MEDIAN | 8.26755E-04 | 1.04606E+01 | 4.46531E+02 | 5.06697E-05 | 5.00000E-01 | 2.43531E+03 | 3.96603E+02 | 5.98563E-02 | 6.60803E-01 |
| STD | 4.75206E-04 | 1.18695E+01 | 4.85199E+05 | 1.72785E-04 | 6.04477E+00 | 1.75085E+04 | 2.61133E+02 | 3.89563E-02 | 2.63606E-01 |
| IQR | 1.00000E-03 | 2.42036E+01 | 9.99990E+05 | 3.47754E-06 | 1.65118E+00 | 5.89695E+02 | 5.39438E+02 | 6.62238E-02 | 4.55138E-01 |
| **IJAYA** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.53256E-05 | 5.57217E+00 | 6.45141E+04 | 5.78551E-05 | 2.84898E+00 | 3.29560E+03 | 2.54323E+01 | 1.00624E-03 | 1.02239E-01 |
| MEDIAN | 1.19927E-05 | 5.55220E+00 | 5.46455E+03 | 5.71774E-05 | 2.84170E+00 | 3.28778E+03 | 1.58175E+01 | 1.00069E-03 | 9.99281E-02 |
| STD | 1.08122E-05 | 9.61495E-01 | 1.75253E+05 | 3.24031E-06 | 1.70219E-01 | 1.13570E+02 | 2.69828E+01 | 2.23760E-05 | 5.77843E-03 |
| IQR | 1.39318E-05 | 1.27108E+00 | 7.32249E+03 | 1.37186E-06 | 2.20054E-01 | 8.11578E+01 | 4.67049E+01 | 2.48365E-05 | 1.37587E-03 |
| **ISCA** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.88352E-04 | 1.02924E+01 | 5.06431E+04 | 1.51169E-04 | 7.41483E+00 | 1.25388E+04 | 5.27692E+01 | 1.03213E-02 | 9.01972E-01 |
| MEDIAN | 9.07772E-05 | 9.01795E+00 | 2.04181E+03 | 1.52257E-04 | 7.14392E+00 | 5.45077E+03 | 1.10823E+01 | 2.17614E-03 | 9.71728E-01 |
| STD | 2.59465E-04 | 6.07831E+00 | 1.49793E+05 | 1.04137E-04 | 4.94714E+00 | 1.27191E+04 | 9.37927E+01 | 1.70780E-02 | 3.59380E-01 |
| IQR | 2.09978E-04 | 1.01167E+01 | 1.25254E+04 | 1.60292E-04 | 8.67436E+00 | 1.91588E+04 | 5.99782E+01 | 1.11238E-02 | 5.64833E-01 |
| **NNA** |  |  |  |  |  |  |  |  |  |
| MEAN | 8.20655E-05 | 1.46746E+01 | 2.39911E+04 | 2.05795E-04 | 1.19841E+01 | 5.04294E+03 | 8.92972E+01 | 1.94127E-02 | 5.96072E-01 |
| MEDIAN | 9.63328E-07 | 1.23790E+01 | 2.05760E+02 | 5.51447E-05 | 1.04436E+01 | 1.31096E+03 | 1.16984E+01 | 5.67027E-03 | 3.90102E-01 |
| STD | 1.58362E-04 | 9.20329E+00 | 9.42769E+04 | 4.20445E-04 | 9.72885E+00 | 1.16526E+04 | 1.57603E+02 | 2.55543E-02 | 4.30474E-01 |
| IQR | 6.82542E-05 | 1.60415E+01 | 7.11520E+02 | 2.19951E-04 | 1.54278E+01 | 2.16621E+03 | 1.03763E+02 | 2.87548E-02 | 6.38341E-01 |
| **CWOA** |  |  |  |  |  |  |  |  |  |
| MEAN | 4.45003E-04 | 1.31055E+01 | 2.52782E+05 | 8.63963E-04 | 1.48260E+01 | 2.25333E+04 | 1.74406E+02 | 2.75758E-02 | 5.47280E-01 |
| MEDIAN | 5.34909E-05 | 1.05113E+01 | 7.43261E+02 | 1.77091E-04 | 1.26578E+01 | 9.92153E+03 | 1.46206E+01 | 7.43876E-03 | 5.61402E-01 |
| STD | 4.83552E-04 | 9.70182E+00 | 4.11586E+05 | 2.34060E-03 | 1.02865E+01 | 2.31948E+04 | 2.28218E+02 | 3.62627E-02 | 3.43019E-01 |
| IQR | 9.99961E-04 | 1.59179E+01 | 4.78801E+05 | 5.36351E-04 | 1.90108E+01 | 4.94168E+04 | 3.41167E+02 | 3.38596E-02 | 6.10151E-01 |
| **WW** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.37351E-04 | 1.10534E+01 | 4.47609E+04 | 1.77288E-04 | 7.87023E+00 | 1.66819E+04 | 1.10611E+02 | 2.44292E-02 | 8.00307E-01 |
| MEDIAN | 1.99805E-05 | 7.52472E+00 | 4.43570E+02 | 6.75913E-05 | 5.60803E+00 | 2.81063E+03 | 5.08511E+01 | 5.88068E-03 | 8.05164E-01 |
| STD | 3.53358E-04 | 8.94998E+00 | 1.95926E+05 | 2.50230E-04 | 7.65259E+00 | 2.11348E+04 | 1.52380E+02 | 2.93859E-02 | 3.39355E-01 |
| IQR | 3.83407E-04 | 1.19207E+01 | 1.79089E+03 | 1.94079E-04 | 1.09393E+01 | 4.81191E+04 | 1.45186E+02 | 4.89611E-02 | 5.48539E-01 |
|  |  |  |  |  | ***T* = 300 K** |  |  |  |  |
| true value | 1.50000E-05 | 5.52105E+00 | 1.00000E+04 | 9.66582E-05 | 2.66667E+00 | 2.11460E+03 | 5.00000E+01 | 1.00000E-03 | 5.55000E+02 |
| **DE** |  |  |  |  |  |  |  |  |  |
| MEAN | 3.51965E-05 | 5.50271E+00 | 2.99166E+04 | 1.53375E-04 | 3.42276E+00 | 6.24026E+03 | 9.19256E+01 | 1.27377E-03 | 3.23885E-01 |
| MEDIAN | 3.10794E-06 | 4.27872E+00 | 1.70806E+03 | 1.17255E-04 | 2.31232E+00 | 2.20501E+03 | 2.69548E+01 | 1.09209E-03 | 2.73994E-01 |
| STD | 9.18538E-05 | 4.00276E+00 | 8.48576E+04 | 7.64279E-05 | 2.61184E+00 | 8.85376E+03 | 1.23941E+02 | 9.61325E-04 | 1.87727E-01 |
| IQR | 2.23260E-05 | 4.14692E+00 | 4.98422E+03 | 1.15996E-04 | 4.64682E+00 | 3.55642E+03 | 1.26080E+02 | 1.64768E-04 | 2.86723E-01 |
| **EBLSHADE** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.89803E-05 | 5.58048E+00 | 3.60037E+04 | 9.67198E-05 | 2.42509E+00 | 2.16960E+03 | 8.19111E+01 | 1.06391E-03 | 1.51261E-01 |
| MEDIAN | 1.50047E-05 | 5.52143E+00 | 1.00057E+04 | 9.66584E-05 | 2.66669E+00 | 2.11460E+03 | 4.99906E+01 | 9.99993E-04 | 9.95037E-02 |
| STD | 8.05950E-05 | 3.25435E+00 | 1.49287E+05 | 2.30722E-05 | 8.56891E-01 | 1.07032E+03 | 7.94635E+01 | 2.06469E-04 | 1.45148E-01 |
| IQR | 4.55628E-06 | 3.63684E-01 | 5.79534E+03 | 4.92001E-06 | 4.10559E-01 | 2.30690E+02 | 1.30276E+01 | 1.85992E-05 | 1.26108E-02 |
| **ADELI** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.50047E-05 | 5.52143E+00 | 1.00057E+04 | 9.66584E-05 | 2.66669E+00 | 2.11460E+03 | 4.99906E+01 | 9.99993E-04 | 9.95037E-02 |
| MEDIAN | 1.50047E-05 | 5.52143E+00 | 1.00057E+04 | 9.66584E-05 | 2.66669E+00 | 2.11460E+03 | 4.99906E+01 | 9.99993E-04 | 9.95037E-02 |
| STD | 3.96781E-14 | 3.12523E-09 | 4.23079E-05 | 3.25395E-15 | 4.15390E-10 | 1.83709E-12 | 8.87300E-08 | 5.32106E-14 | 1.40159E-17 |
| IQR | 6.50000E-14 | 5.00000E-09 | 6.00000E-05 | 0.00000E+00 | 0.00000E+00 | 0.00000E+00 | 1.35000E-07 | 9.99999E-14 | 0.00000E+00 |
| **NDE** |  |  |  |  |  |  |  |  |  |
| MEAN | 4.82497E-05 | 6.59966E+00 | 4.46612E+04 | 1.47570E-04 | 4.58182E+00 | 6.25574E+03 | 8.39660E+01 | 2.54601E-03 | 3.48055E-01 |
| MEDIAN | 1.50047E-05 | 5.52143E+00 | 9.88441E+03 | 9.66584E-05 | 2.66669E+00 | 2.11460E+03 | 4.99907E+01 | 1.00148E-03 | 9.95052E-02 |
| STD | 1.30992E-04 | 5.27294E+00 | 1.84293E+05 | 1.33767E-04 | 4.80092E+00 | 1.07478E+04 | 9.34517E+01 | 3.89367E-03 | 4.56456E-01 |
| IQR | 8.76603E-06 | 3.54898E-01 | 6.23858E+03 | 1.32674E-06 | 2.86598E-01 | 8.04543E+00 | 1.25602E+01 | 6.81420E-04 | 4.22018E-01 |
| **MABC** |  |  |  |  |  |  |  |  |  |
| MEAN | 6.94090E-05 | 8.71378E+00 | 1.84343E+03 | 1.44709E-04 | 2.46263E+00 | 5.11243E+03 | 1.84834E+02 | 8.41390E-03 | 6.14680E-01 |
| MEDIAN | 3.57725E-06 | 5.74748E+00 | 5.18707E+02 | 1.11707E-04 | 8.93544E-01 | 1.86541E+03 | 9.36889E+01 | 1.50237E-03 | 6.98864E-01 |
| STD | 1.50035E-04 | 6.92668E+00 | 4.64035E+03 | 1.00540E-04 | 3.26196E+00 | 8.10759E+03 | 1.82721E+02 | 1.61845E-02 | 2.76627E-01 |
| IQR | 6.92923E-05 | 8.77817E+00 | 1.04964E+03 | 6.81027E-05 | 2.67293E+00 | 1.68079E+03 | 3.20176E+02 | 3.24728E-03 | 3.73436E-01 |
| **TLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.53432E-05 | 5.54448E+00 | 2.14158E+04 | 9.66637E-05 | 2.66825E+00 | 2.11506E+03 | 4.93823E+01 | 9.99700E-04 | 9.95042E-02 |
| MEDIAN | 1.50047E-05 | 5.52143E+00 | 1.00057E+04 | 9.66584E-05 | 2.66669E+00 | 2.11460E+03 | 4.99906E+01 | 9.99993E-04 | 9.95037E-02 |
| STD | 1.86055E-06 | 1.26401E-01 | 7.99545E+04 | 3.13636E-08 | 8.70698E-03 | 2.57147E+00 | 3.34853E+00 | 1.59853E-06 | 2.66395E-06 |
| IQR | 6.50000E-14 | 5.50000E-09 | 7.00000E-05 | 0.00000E+00 | 1.00000E-09 | 0.00000E+00 | 1.55000E-07 | 9.99999E-14 | 0.00000E+00 |
| **GOTLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.03177E-04 | 1.12720E+01 | 3.11353E+04 | 2.20241E-04 | 5.42039E+00 | 9.19891E+03 | 1.62162E+02 | 1.67984E-02 | 8.09807E-01 |
| MEDIAN | 8.74259E-05 | 1.09652E+01 | 5.27834E+02 | 2.15163E-04 | 3.17672E+00 | 4.08508E+03 | 5.68037E+01 | 2.44336E-03 | 8.48772E-01 |
| STD | 2.83682E-04 | 6.76314E+00 | 1.02605E+05 | 1.50741E-04 | 5.71032E+00 | 1.26659E+04 | 1.93759E+02 | 2.67072E-02 | 2.25369E-01 |
| IQR | 2.64320E-04 | 9.80581E+00 | 4.18183E+03 | 1.92999E-04 | 8.66259E+00 | 7.68620E+03 | 2.88298E+02 | 1.39422E-02 | 1.97709E-01 |
| **STLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.50047E-05 | 5.52143E+00 | 1.00057E+04 | 9.66584E-05 | 2.66669E+00 | 2.11460E+03 | 4.99906E+01 | 9.99993E-04 | 9.95037E-02 |
| MEDIAN | 1.50047E-05 | 5.52143E+00 | 1.00057E+04 | 9.66584E-05 | 2.66669E+00 | 2.11460E+03 | 4.99906E+01 | 9.99993E-04 | 9.95037E-02 |
| STD | 3.80041E-14 | 3.01967E-09 | 3.80351E-05 | 5.27666E-15 | 5.01762E-10 | 1.83709E-12 | 9.57435E-08 | 5.02542E-14 | 1.40159E-17 |
| IQR | 5.00000E-14 | 4.00000E-09 | 5.00000E-05 | 0.00000E+00 | 1.00000E-09 | 0.00000E+00 | 1.40000E-07 | 9.99999E-14 | 0.00000E+00 |
| **PSO** |  |  |  |  |  |  |  |  |  |
| MEAN | 4.99841E-04 | 1.65583E+01 | 5.86175E+05 | 1.33541E-04 | 3.66979E+00 | 1.00155E+04 | 2.63100E+02 | 3.70550E-02 | 6.66922E-01 |
| MEDIAN | 3.46468E-04 | 1.04476E+01 | 1.00000E+06 | 1.09294E-04 | 5.00000E-01 | 1.53484E+03 | 1.10413E+02 | 1.50444E-03 | 8.08031E-01 |
| STD | 4.85677E-04 | 1.28935E+01 | 4.94943E+05 | 1.33073E-04 | 8.00745E+00 | 1.86978E+04 | 2.55971E+02 | 4.24542E-02 | 2.29116E-01 |
| IQR | 1.00000E-03 | 2.57803E+01 | 9.99581E+05 | 2.45142E-05 | 1.96857E+00 | 2.79560E+02 | 5.37096E+02 | 7.10609E-02 | 2.75491E-01 |
| **IJAYA** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.39583E-05 | 5.16215E+00 | 3.40167E+04 | 9.90186E-05 | 2.82302E+00 | 2.17471E+03 | 4.11632E+01 | 1.02105E-03 | 1.07285E-01 |
| MEDIAN | 9.64908E-06 | 5.07492E+00 | 5.00575E+03 | 9.86551E-05 | 2.85924E+00 | 2.16722E+03 | 2.82659E+01 | 1.01070E-03 | 1.00395E-01 |
| STD | 1.09228E-05 | 1.12643E+00 | 1.02314E+05 | 1.22530E-05 | 4.63833E-01 | 1.69646E+02 | 4.28823E+01 | 3.55346E-05 | 3.84984E-02 |
| IQR | 1.75392E-05 | 1.67109E+00 | 1.60320E+04 | 3.63271E-06 | 3.50526E-01 | 9.28388E+01 | 5.43289E+01 | 3.53854E-05 | 3.02838E-03 |
| **ISCA** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.68071E-04 | 8.26372E+00 | 1.05802E+05 | 2.98667E-04 | 9.83589E+00 | 1.19223E+04 | 8.74530E+01 | 1.63487E-02 | 8.78696E-01 |
| MEDIAN | 1.26977E-04 | 6.57343E+00 | 7.89350E+03 | 2.72764E-04 | 8.46807E+00 | 4.29228E+03 | 1.66668E+01 | 2.28548E-03 | 9.12351E-01 |
| STD | 3.00015E-04 | 4.87900E+00 | 2.28831E+05 | 2.21605E-04 | 7.24243E+00 | 1.38656E+04 | 1.37925E+02 | 2.52095E-02 | 2.94374E-01 |
| IQR | 5.20150E-04 | 6.25902E+00 | 1.00183E+05 | 3.56002E-04 | 1.09203E+01 | 1.64469E+04 | 9.09044E+01 | 1.40251E-02 | 3.10670E-01 |
| **NNA** |  |  |  |  |  |  |  |  |  |
| MEAN | 7.29041E-05 | 1.03187E+01 | 5.23172E+04 | 2.47645E-04 | 1.36773E+01 | 5.69996E+03 | 8.82562E+01 | 1.95798E-02 | 7.48232E-01 |
| MEDIAN | 5.69582E-07 | 6.86258E+00 | 3.42842E+02 | 7.70737E-05 | 1.18282E+01 | 9.76485E+02 | 1.34118E+01 | 9.03104E-03 | 7.48111E-01 |
| STD | 2.01509E-04 | 8.74179E+00 | 1.68414E+05 | 4.06486E-04 | 9.47471E+00 | 1.18583E+04 | 1.46120E+02 | 2.25199E-02 | 3.21327E-01 |
| IQR | 7.21391E-06 | 1.30264E+01 | 2.28832E+03 | 3.11029E-04 | 1.43017E+01 | 2.82092E+03 | 9.48686E+01 | 2.68469E-02 | 6.18640E-01 |
| **CWOA** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.90205E-04 | 1.41316E+01 | 1.35669E+05 | 7.80121E-04 | 1.37397E+01 | 1.92959E+04 | 1.81484E+02 | 2.36425E-02 | 6.60415E-01 |
| MEDIAN | 2.29921E-06 | 1.22522E+01 | 5.67376E+02 | 2.73938E-04 | 1.30797E+01 | 3.57410E+03 | 2.24290E+01 | 4.45749E-03 | 7.43557E-01 |
| STD | 4.29717E-04 | 1.07750E+01 | 2.92205E+05 | 1.96319E-03 | 9.94002E+00 | 2.30073E+04 | 2.37135E+02 | 3.34828E-02 | 2.92262E-01 |
| IQR | 7.75671E-04 | 2.25030E+01 | 7.84951E+04 | 6.06509E-04 | 1.95166E+01 | 4.96717E+04 | 3.90461E+02 | 3.08310E-02 | 4.81705E-01 |
| **WW** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.51084E-04 | 1.31224E+01 | 1.01786E+05 | 3.12718E-04 | 1.02195E+01 | 1.81410E+04 | 1.04869E+02 | 1.87520E-02 | 8.27972E-01 |
| MEDIAN | 1.65052E-05 | 1.10316E+01 | 1.68236E+02 | 2.79606E-04 | 8.37853E+00 | 2.85763E+03 | 1.91177E+01 | 5.50126E-03 | 8.61913E-01 |
| STD | 3.51687E-04 | 9.35477E+00 | 2.81086E+05 | 2.51901E-04 | 8.42864E+00 | 2.16979E+04 | 1.68479E+02 | 2.62596E-02 | 2.42413E-01 |
| IQR | 4.60577E-04 | 1.61504E+01 | 5.09554E+03 | 3.74895E-04 | 1.34022E+01 | 4.86799E+04 | 1.15701E+02 | 2.44940E-02 | 2.70548E-01 |
|  |  |  |  |  | ***T* = 310 K** |  |  |  |  |
| true value | 1.50000E-05 | 5.34295E+00 | 1.00000E+04 | 1.59152E-04 | 2.61290E+00 | 1.41896E+03 | 6.00000E+01 | 1.01000E-03 | 5.55000E+02 |
| **DE** |  |  |  |  |  |  |  |  |  |
| MEAN | 5.27913E-05 | 5.83741E+00 | 1.08362E+04 | 2.97902E-04 | 4.24758E+00 | 1.14657E+04 | 8.02052E+01 | 1.17553E-03 | 4.17188E-01 |
| MEDIAN | 5.92881E-06 | 4.57997E+00 | 2.53709E+03 | 3.09783E-04 | 4.52646E+00 | 3.21489E+03 | 3.66747E+01 | 1.13575E-03 | 4.03099E-01 |
| STD | 1.46997E-04 | 3.93926E+00 | 2.64949E+04 | 1.21598E-04 | 2.45028E+00 | 1.66551E+04 | 9.46525E+01 | 1.63952E-04 | 2.10138E-01 |
| IQR | 3.59199E-05 | 3.71012E+00 | 5.06135E+03 | 2.14065E-04 | 3.92978E+00 | 9.16739E+03 | 1.14195E+02 | 1.80142E-04 | 3.29481E-01 |
| **EBLSHADE** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.03670E-05 | 4.78862E+00 | 5.79370E+03 | 1.87413E-04 | 2.54298E+00 | 3.70210E+03 | 1.17724E+02 | 1.21428E-03 | 1.94172E-01 |
| MEDIAN | 9.67504E-06 | 4.87001E+00 | 3.29031E+03 | 1.59151E-04 | 2.59268E+00 | 1.41864E+03 | 7.68485E+01 | 1.03836E-03 | 1.03575E-01 |
| STD | 4.21304E-05 | 2.60373E+00 | 5.98290E+03 | 8.13721E-05 | 1.48032E+00 | 8.53903E+03 | 9.62114E+01 | 8.94416E-04 | 1.90825E-01 |
| IQR | 1.47762E-05 | 2.51336E+00 | 8.27975E+03 | 2.33299E-05 | 1.18970E+00 | 2.20816E+02 | 9.47566E+01 | 1.17037E-04 | 1.05460E-01 |
| **ADELI** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.50078E-05 | 5.34355E+00 | 1.00089E+04 | 1.59151E-04 | 2.61295E+00 | 1.41897E+03 | 5.99840E+01 | 1.00999E-03 | 9.95037E-02 |
| MEDIAN | 1.50078E-05 | 5.34355E+00 | 1.00089E+04 | 1.59151E-04 | 2.61295E+00 | 1.41897E+03 | 5.99840E+01 | 1.00999E-03 | 9.95037E-02 |
| STD | 2.18820E-14 | 1.64496E-09 | 2.04786E-05 | 0.00000E+00 | 4.76095E-10 | 4.59272E-13 | 6.10734E-08 | 8.75992E-19 | 1.40159E-17 |
| IQR | 3.00000E-14 | 2.00000E-09 | 3.00000E-05 | 0.00000E+00 | 1.00000E-09 | 0.00000E+00 | 9.00000E-08 | 0.00000E+00 | 0.00000E+00 |
| **NDE** |  |  |  |  |  |  |  |  |  |
| MEAN | 5.03624E-05 | 6.97618E+00 | 4.98906E+04 | 2.36249E-04 | 4.72704E+00 | 3.49302E+03 | 1.04350E+02 | 4.71088E-03 | 3.21355E-01 |
| MEDIAN | 1.50078E-05 | 5.34355E+00 | 6.77703E+03 | 1.59151E-04 | 2.61295E+00 | 1.41837E+03 | 5.99865E+01 | 1.01904E-03 | 9.95390E-02 |
| STD | 1.46708E-04 | 5.28828E+00 | 1.94859E+05 | 2.56322E-04 | 5.52670E+00 | 8.78848E+03 | 9.93430E+01 | 1.01918E-02 | 3.58313E-01 |
| IQR | 8.95872E-06 | 1.69619E+00 | 7.28780E+03 | 1.22426E-06 | 3.05234E-01 | 6.68075E+01 | 5.56161E+01 | 1.02304E-04 | 4.31138E-01 |
| **MABC** |  |  |  |  |  |  |  |  |  |
| MEAN | 5.44973E-05 | 7.78116E+00 | 3.55852E+03 | 2.38094E-04 | 2.67344E+00 | 3.25170E+03 | 1.57267E+02 | 5.89561E-03 | 6.36940E-01 |
| MEDIAN | 1.76571E-06 | 4.58855E+00 | 6.35767E+02 | 1.95533E-04 | 7.67802E-01 | 1.11911E+03 | 9.53646E+01 | 1.30397E-03 | 6.69238E-01 |
| STD | 1.25503E-04 | 7.57886E+00 | 1.57680E+04 | 1.38735E-04 | 3.14519E+00 | 5.76172E+03 | 1.58093E+02 | 1.85983E-02 | 3.37739E-01 |
| IQR | 3.32981E-05 | 7.30264E+00 | 1.12514E+03 | 1.43949E-04 | 3.54424E+00 | 1.17214E+03 | 2.42287E+02 | 9.32032E-04 | 7.07899E-01 |
| **TLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.56416E-05 | 5.38308E+00 | 2.86965E+04 | 1.59244E-04 | 2.62248E+00 | 1.42101E+03 | 5.84375E+01 | 1.00961E-03 | 9.95057E-02 |
| MEDIAN | 1.50078E-05 | 5.34355E+00 | 1.00089E+04 | 1.59151E-04 | 2.61295E+00 | 1.41897E+03 | 5.99840E+01 | 1.00999E-03 | 9.95037E-02 |
| STD | 3.34333E-06 | 2.06338E-01 | 1.25351E+05 | 6.16257E-07 | 5.73996E-02 | 1.22468E+01 | 8.56092E+00 | 1.89663E-06 | 1.07609E-05 |
| IQR | 4.00000E-14 | 3.00000E-09 | 3.00000E-05 | 0.00000E+00 | 1.00000E-09 | 0.00000E+00 | 8.00000E-08 | 0.00000E+00 | 0.00000E+00 |
| **GOTLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.27436E-04 | 1.07688E+01 | 4.32346E+04 | 4.76334E-04 | 1.03070E+01 | 5.24197E+03 | 8.92025E+01 | 1.16586E-02 | 7.65122E-01 |
| MEDIAN | 2.25272E-06 | 8.84283E+00 | 6.69111E+02 | 3.91107E-04 | 9.52303E+00 | 1.93955E+03 | 1.45832E+01 | 1.87400E-03 | 8.73647E-01 |
| STD | 2.48715E-04 | 8.37863E+00 | 1.69878E+05 | 2.86765E-04 | 7.88097E+00 | 6.54736E+03 | 1.40132E+02 | 2.46066E-02 | 3.38118E-01 |
| IQR | 1.19829E-04 | 1.20362E+01 | 2.05705E+03 | 3.96603E-04 | 1.10699E+01 | 6.20911E+03 | 1.16335E+02 | 3.99547E-03 | 5.43553E-01 |
| **STLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.50078E-05 | 5.34355E+00 | 1.00089E+04 | 1.59151E-04 | 2.61295E+00 | 1.41897E+03 | 5.99840E+01 | 1.00999E-03 | 9.95037E-02 |
| MEDIAN | 1.50078E-05 | 5.34355E+00 | 1.00089E+04 | 1.59151E-04 | 2.61295E+00 | 1.41897E+03 | 5.99840E+01 | 1.00999E-03 | 9.95037E-02 |
| STD | 3.22466E-14 | 2.57925E-09 | 2.97295E-05 | 0.00000E+00 | 6.00653E-10 | 3.00327E-07 | 9.20937E-08 | 8.75992E-19 | 1.40159E-17 |
| IQR | 4.00000E-14 | 3.00000E-09 | 4.00000E-05 | 0.00000E+00 | 1.00000E-09 | 0.00000E+00 | 1.15000E-07 | 0.00000E+00 | 0.00000E+00 |
| **PSO** |  |  |  |  |  |  |  |  |  |
| MEAN | 3.58817E-04 | 1.30453E+01 | 4.69617E+05 | 4.51996E-04 | 6.61931E+00 | 5.84557E+03 | 2.97136E+02 | 4.17000E-02 | 6.90010E-01 |
| MEDIAN | 4.39423E-05 | 6.48566E+00 | 1.48109E+03 | 2.16223E-04 | 5.00000E-01 | 1.00695E+03 | 4.82017E+02 | 3.19353E-02 | 7.09783E-01 |
| STD | 4.50034E-04 | 1.19260E+01 | 4.99383E+05 | 1.39382E-03 | 1.11489E+01 | 1.47241E+04 | 2.61643E+02 | 4.06614E-02 | 3.52375E-01 |
| IQR | 1.00000E-03 | 2.58827E+01 | 9.99990E+05 | 7.59159E-05 | 5.24631E+00 | 4.28276E+02 | 5.26325E+02 | 6.49896E-02 | 7.72248E-01 |
| **IJAYA** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.72494E-05 | 5.15134E+00 | 5.28239E+04 | 1.76356E-04 | 3.13596E+00 | 1.60237E+03 | 3.65969E+01 | 1.03768E-03 | 1.15207E-01 |
| MEDIAN | 1.24809E-05 | 5.11996E+00 | 5.11879E+03 | 1.67617E-04 | 3.15428E+00 | 1.53277E+03 | 9.21597E+00 | 1.01903E-03 | 1.01439E-01 |
| STD | 1.99954E-05 | 1.46947E+00 | 1.58179E+05 | 3.23727E-05 | 8.90283E-01 | 3.22490E+02 | 6.22089E+01 | 7.01828E-05 | 5.84609E-02 |
| IQR | 1.94096E-05 | 1.79802E+00 | 9.23729E+03 | 1.87428E-05 | 5.93770E-01 | 1.77576E+02 | 3.57547E+01 | 3.49426E-05 | 5.82171E-03 |
| **ISCA** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.24319E-04 | 1.06260E+01 | 7.24301E+04 | 7.45896E-04 | 1.61161E+01 | 6.79780E+03 | 7.35759E+01 | 8.06081E-03 | 9.53550E-01 |
| MEDIAN | 1.44675E-04 | 8.77503E+00 | 3.99817E+03 | 5.45807E-04 | 1.61995E+01 | 2.07570E+03 | 1.29011E+01 | 2.15152E-03 | 9.80318E-01 |
| STD | 2.46235E-04 | 6.61245E+00 | 1.85597E+05 | 5.42216E-04 | 8.76032E+00 | 1.06816E+04 | 9.79728E+01 | 1.59653E-02 | 2.47794E-01 |
| IQR | 3.20991E-04 | 9.05965E+00 | 3.63221E+04 | 7.41526E-04 | 1.51740E+01 | 4.33502E+03 | 1.49216E+02 | 2.13848E-03 | 2.71945E-01 |
| **NNA** |  |  |  |  |  |  |  |  |  |
| MEAN | 3.53673E-05 | 1.14526E+01 | 4.67456E+04 | 2.48647E-04 | 1.62427E+01 | 3.65305E+03 | 8.87110E+01 | 1.53823E-02 | 8.63015E-01 |
| MEDIAN | 2.63231E-07 | 8.97624E+00 | 3.43780E+02 | 1.01777E-05 | 1.46241E+01 | 5.46250E+02 | 4.19670E+00 | 3.84468E-03 | 7.07078E-01 |
| STD | 9.43393E-05 | 9.00525E+00 | 1.44633E+05 | 3.57340E-04 | 8.88477E+00 | 8.28385E+03 | 1.50249E+02 | 2.12076E-02 | 2.76059E-01 |
| IQR | 7.00772E-06 | 1.66556E+01 | 2.66049E+03 | 3.98779E-04 | 1.60798E+01 | 1.45594E+03 | 1.18683E+02 | 1.67959E-02 | 3.64503E-01 |
| **CWOA** |  |  |  |  |  |  |  |  |  |
| MEAN | 4.42549E-04 | 1.23600E+01 | 1.60225E+05 | 1.29127E-03 | 1.48703E+01 | 1.63984E+04 | 2.39430E+02 | 3.45453E-02 | 8.23218E-01 |
| MEDIAN | 5.71073E-05 | 8.00318E+00 | 5.11507E+02 | 4.00117E-04 | 1.27622E+01 | 1.02316E+03 | 1.50944E+02 | 1.24945E-02 | 7.45968E-01 |
| STD | 4.85517E-04 | 9.95508E+00 | 3.36239E+05 | 2.45881E-03 | 1.15410E+01 | 2.22917E+04 | 2.25625E+02 | 3.83360E-02 | 2.24000E-01 |
| IQR | 9.99995E-04 | 1.23539E+01 | 3.88232E+04 | 1.27213E-03 | 2.44326E+01 | 4.97047E+04 | 4.73841E+02 | 6.15521E-02 | 2.83878E-01 |
| **WW** |  |  |  |  |  |  |  |  |  |
| MEAN | 3.04057E-04 | 1.61944E+01 | 5.14322E+04 | 1.09441E-03 | 1.49717E+01 | 2.38136E+04 | 1.32634E+02 | 1.65234E-02 | 8.98584E-01 |
| MEDIAN | 5.43077E-05 | 1.38977E+01 | 3.52454E+02 | 7.85762E-04 | 1.34910E+01 | 5.76096E+03 | 2.62317E+01 | 3.69576E-03 | 8.90367E-01 |
| STD | 3.82272E-04 | 9.56841E+00 | 1.99483E+05 | 1.18760E-03 | 9.78946E+00 | 2.39948E+04 | 1.80861E+02 | 2.29666E-02 | 1.71250E-01 |
| IQR | 6.59899E-04 | 1.71357E+01 | 2.73118E+03 | 1.03855E-03 | 1.85467E+01 | 4.91248E+04 | 2.37493E+02 | 2.52921E-02 | 2.73300E-01 |
|  |  |  |  |  | ***T* = 320 K** |  |  |  |  |
| true value | 1.50000E-05 | 5.17598E+00 | 1.00000E+04 | 2.54008E-04 | 2.56250E+00 | 9.76205E+02 | 7.00000E+01 | 1.02000E-03 | 5.55000E+02 |
| **DE** |  |  |  |  |  |  |  |  |  |
| MEAN | 7.26330E-05 | 6.85495E+00 | 9.71347E+03 | 5.11873E-04 | 6.80687E+00 | 7.12817E+03 | 7.77148E+01 | 1.25039E-03 | 5.51930E-01 |
| MEDIAN | 9.30567E-06 | 5.37535E+00 | 2.34236E+03 | 3.87326E-04 | 4.22513E+00 | 9.36575E+02 | 2.32693E+01 | 1.17770E-03 | 5.19937E-01 |
| STD | 1.41165E-04 | 5.09206E+00 | 2.98843E+04 | 4.40747E-04 | 7.98824E+00 | 1.31061E+04 | 9.92735E+01 | 2.95753E-04 | 2.79318E-01 |
| IQR | 9.23265E-05 | 8.22767E+00 | 4.53959E+03 | 4.05243E-04 | 5.71293E+00 | 4.23276E+03 | 1.18074E+02 | 1.76734E-04 | 4.25355E-01 |
| **EBLSHADE** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.71503E-05 | 5.83730E+00 | 9.28327E+03 | 2.85733E-04 | 4.98708E+00 | 2.72951E+03 | 1.01506E+02 | 1.30518E-03 | 2.45268E-01 |
| MEDIAN | 5.31441E-06 | 4.74271E+00 | 5.98265E+03 | 2.53282E-04 | 2.56252E+00 | 9.64449E+02 | 6.99971E+01 | 1.04226E-03 | 1.05279E-01 |
| STD | 3.45535E-05 | 6.33275E+00 | 1.42950E+04 | 1.86435E-04 | 7.07115E+00 | 8.27988E+03 | 9.65207E+01 | 1.30672E-03 | 2.72333E-01 |
| IQR | 1.48147E-05 | 2.70705E+00 | 8.15662E+03 | 1.00118E-04 | 2.76648E+00 | 4.62456E+02 | 1.21334E+02 | 9.29293E-05 | 1.19986E-01 |
| **ADELI** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.48621E-05 | 5.61478E+00 | 2.25242E+04 | 2.51868E-04 | 3.07064E+00 | 9.56061E+02 | 7.47471E+01 | 1.02337E-03 | 1.17985E-01 |
| MEDIAN | 1.50011E-05 | 5.17607E+00 | 1.00009E+04 | 2.54009E-04 | 2.56252E+00 | 9.76210E+02 | 6.99971E+01 | 1.02000E-03 | 9.95037E-02 |
| STD | 4.41223E-06 | 3.52838E+00 | 8.99649E+04 | 4.07513E-05 | 3.84228E+00 | 1.37779E+02 | 5.04158E+01 | 2.90272E-05 | 1.27118E-01 |
| IQR | 3.00000E-14 | 3.00000E-09 | 3.00000E-05 | 1.00000E-13 | 1.00000E-09 | 1.00000E-07 | 1.05000E-07 | 0.00000E+00 | 0.00000E+00 |
| **NDE** |  |  |  |  |  |  |  |  |  |
| MEAN | 4.13673E-05 | 1.07901E+01 | 6.78533E+04 | 2.04782E-04 | 9.69368E+00 | 1.17286E+03 | 6.22102E+01 | 3.46622E-03 | 4.73581E-01 |
| MEDIAN | 4.58545E-06 | 5.31060E+00 | 3.67429E+03 | 2.48647E-04 | 2.74733E+00 | 8.76418E+02 | 4.95192E+01 | 1.06238E-03 | 1.06973E-01 |
| STD | 1.60569E-04 | 1.02441E+01 | 2.26567E+05 | 2.68835E-04 | 9.99184E+00 | 3.05491E+03 | 6.52108E+01 | 9.22788E-03 | 4.41768E-01 |
| IQR | 1.67557E-05 | 1.13360E+01 | 9.91554E+03 | 2.54257E-04 | 1.68951E+01 | 7.37479E+02 | 9.97529E+01 | 4.05764E-04 | 9.07812E-01 |
| **MABC** |  |  |  |  |  |  |  |  |  |
| MEAN | 9.68675E-05 | 1.23065E+01 | 5.44548E+04 | 2.34224E-04 | 9.28653E+00 | 1.45762E+03 | 1.01078E+02 | 2.26295E-03 | 6.93816E-01 |
| MEDIAN | 6.95611E-06 | 8.90569E+00 | 1.30332E+03 | 1.19179E-06 | 5.63072E+00 | 3.49592E+02 | 4.22161E+01 | 1.30592E-03 | 8.31866E-01 |
| STD | 2.07006E-04 | 9.80658E+00 | 1.89291E+05 | 4.77514E-04 | 8.76429E+00 | 6.96057E+03 | 1.36443E+02 | 2.65048E-03 | 3.58807E-01 |
| IQR | 9.95496E-05 | 1.38549E+01 | 5.93767E+03 | 2.43577E-04 | 1.36571E+01 | 4.60622E+02 | 1.30006E+02 | 1.01208E-03 | 7.77650E-01 |
| **TLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.39576E-05 | 5.64122E+00 | 1.11698E+04 | 2.38568E-04 | 3.36379E+00 | 9.32734E+02 | 7.13598E+01 | 1.21300E-03 | 1.52502E-01 |
| MEDIAN | 1.50011E-05 | 5.17607E+00 | 1.00009E+04 | 2.54009E-04 | 2.56252E+00 | 9.76210E+02 | 6.99971E+01 | 1.02000E-03 | 9.95037E-02 |
| STD | 4.61632E-06 | 2.97800E+00 | 1.43867E+04 | 6.03222E-05 | 4.02652E+00 | 1.53019E+02 | 3.71213E+01 | 8.92368E-04 | 2.13885E-01 |
| IQR | 5.00000E-14 | 3.00000E-09 | 5.00000E-05 | 1.00000E-13 | 1.00000E-09 | 3.00000E-07 | 1.60000E-07 | 0.00000E+00 | 0.00000E+00 |
| **GOTLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.33014E-04 | 1.11720E+01 | 9.61439E+04 | 4.86648E-04 | 1.13031E+01 | 2.34334E+03 | 7.61548E+01 | 1.97709E-03 | 7.31274E-01 |
| MEDIAN | 1.43191E-05 | 8.41820E+00 | 5.69572E+03 | 1.00515E-05 | 7.80442E+00 | 4.17426E+02 | 5.16922E+00 | 1.37460E-03 | 8.05013E-01 |
| STD | 2.04914E-04 | 8.48535E+00 | 1.99332E+05 | 1.43244E-03 | 8.32415E+00 | 5.50450E+03 | 1.30764E+02 | 1.41306E-03 | 3.09462E-01 |
| IQR | 2.26827E-04 | 1.17431E+01 | 7.07113E+04 | 5.69483E-04 | 1.39522E+01 | 5.75727E+02 | 6.56241E+01 | 8.65017E-04 | 4.17941E-01 |
| **STLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.47069E-05 | 5.66281E+00 | 9.81358E+03 | 2.49028E-04 | 3.10051E+00 | 9.58697E+02 | 6.90416E+01 | 1.02752E-03 | 1.17304E-01 |
| MEDIAN | 1.50011E-05 | 5.17607E+00 | 1.00009E+04 | 2.54009E-04 | 2.56252E+00 | 9.76210E+02 | 6.99971E+01 | 1.02000E-03 | 9.95037E-02 |
| STD | 2.10056E-06 | 3.47605E+00 | 1.33786E+03 | 3.55683E-05 | 3.84200E+00 | 1.25065E+02 | 6.82386E+00 | 5.37231E-05 | 1.27123E-01 |
| IQR | 5.00000E-14 | 4.00000E-09 | 4.00000E-05 | 1.00000E-13 | 1.00000E-09 | 2.00000E-07 | 1.65000E-07 | 0.00000E+00 | 0.00000E+00 |
| **PSO** |  |  |  |  |  |  |  |  |  |
| MEAN | 4.28573E-04 | 1.30514E+01 | 4.71916E+05 | 9.60042E-04 | 1.61376E+01 | 7.21107E+03 | 1.66622E+02 | 3.06821E-02 | 6.92880E-01 |
| MEDIAN | 7.20290E-05 | 6.97497E+00 | 1.15796E+04 | 1.01463E-10 | 1.89715E+01 | 5.47520E+02 | 1.00000E-01 | 1.19046E-03 | 9.26404E-01 |
| STD | 4.75991E-04 | 1.18202E+01 | 5.02611E+05 | 2.69650E-03 | 1.43659E+01 | 1.72395E+04 | 2.31369E+02 | 4.12168E-02 | 4.05119E-01 |
| IQR | 1.00000E-03 | 2.70695E+01 | 9.99990E+05 | 2.78904E-04 | 2.95000E+01 | 7.48530E+02 | 4.52731E+02 | 6.71751E-02 | 8.68329E-01 |
| **IJAYA** |  |  |  |  |  |  |  |  |  |
| MEAN | 3.91128E-05 | 5.61085E+00 | 4.68665E+04 | 3.90409E-04 | 6.29427E+00 | 2.01458E+03 | 3.98225E+01 | 1.13848E-03 | 3.18674E-01 |
| MEDIAN | 4.47984E-06 | 4.22549E+00 | 3.88912E+03 | 3.32444E-04 | 4.72130E+00 | 1.13989E+03 | 1.23042E+01 | 1.05966E-03 | 1.88337E-01 |
| STD | 8.74753E-05 | 4.06095E+00 | 1.49984E+05 | 2.47406E-04 | 5.68530E+00 | 2.38276E+03 | 7.24754E+01 | 2.18656E-04 | 2.86962E-01 |
| IQR | 2.04562E-05 | 3.30507E+00 | 1.76595E+04 | 3.35026E-04 | 4.20486E+00 | 1.21482E+03 | 3.93728E+01 | 1.36508E-04 | 2.40580E-01 |
| **ISCA** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.40725E-04 | 1.14031E+01 | 1.01573E+05 | 8.05252E-04 | 1.28256E+01 | 2.55507E+03 | 6.48675E+01 | 4.68183E-03 | 8.40888E-01 |
| MEDIAN | 4.92732E-05 | 8.72217E+00 | 4.41892E+03 | 2.25511E-04 | 1.24327E+01 | 4.97558E+02 | 6.77838E+00 | 1.53815E-03 | 8.39373E-01 |
| STD | 3.21900E-04 | 7.43918E+00 | 2.01809E+05 | 1.61867E-03 | 7.66339E+00 | 7.86467E+03 | 1.03697E+02 | 1.05459E-02 | 2.42200E-01 |
| IQR | 3.80371E-04 | 1.09995E+01 | 9.82014E+04 | 9.42977E-04 | 1.23849E+01 | 9.51094E+02 | 8.07893E+01 | 1.00389E-03 | 2.70310E-01 |
| **NNA** |  |  |  |  |  |  |  |  |  |
| MEAN | 6.69980E-05 | 1.57615E+01 | 3.49472E+04 | 4.15971E-04 | 1.82391E+01 | 9.56393E+02 | 7.28741E+01 | 6.16946E-03 | 9.84641E-01 |
| MEDIAN | 2.29885E-07 | 1.51050E+01 | 3.17890E+02 | 1.86967E-07 | 1.90479E+01 | 3.31800E+02 | 1.09340E+01 | 2.45555E-03 | 1.00726E+00 |
| STD | 1.38456E-04 | 8.78396E+00 | 1.20768E+05 | 1.10718E-03 | 8.39411E+00 | 3.22574E+03 | 1.15489E+02 | 7.97423E-03 | 1.49736E-01 |
| IQR | 6.39691E-05 | 1.52349E+01 | 7.94627E+02 | 7.53367E-05 | 1.28133E+01 | 3.08576E+02 | 8.80296E+01 | 5.50315E-03 | 1.01562E-02 |
| **CWOA** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.85745E-04 | 1.19415E+01 | 2.36128E+05 | 1.70647E-03 | 1.61498E+01 | 4.55409E+03 | 1.67886E+02 | 1.63148E-02 | 8.05619E-01 |
| MEDIAN | 2.10437E-07 | 7.25140E+00 | 3.33189E+03 | 7.36514E-09 | 1.63437E+01 | 4.57514E+02 | 3.94865E+01 | 3.86311E-03 | 1.00102E+00 |
| STD | 4.25718E-04 | 1.04561E+01 | 4.08767E+05 | 3.63302E-03 | 1.07295E+01 | 1.30381E+04 | 2.04233E+02 | 2.52596E-02 | 3.83244E-01 |
| IQR | 6.98652E-04 | 1.72536E+01 | 1.38863E+05 | 3.24691E-04 | 1.93018E+01 | 4.59135E+02 | 3.38072E+02 | 1.85643E-02 | 2.98172E-01 |
| **WW** |  |  |  |  |  |  |  |  |  |
| MEAN | 3.31199E-04 | 1.20148E+01 | 1.09691E+05 | 9.46532E-04 | 1.88406E+01 | 1.13513E+04 | 1.65089E+02 | 7.69268E-03 | 8.85889E-01 |
| MEDIAN | 7.55199E-05 | 8.16182E+00 | 5.92042E+03 | 1.03281E-04 | 1.76841E+01 | 4.54399E+02 | 3.17310E+01 | 1.99298E-03 | 9.38947E-01 |
| STD | 4.04170E-04 | 9.61501E+00 | 2.70733E+05 | 1.96931E-03 | 1.07836E+01 | 2.05170E+04 | 2.01020E+02 | 1.60335E-02 | 1.95426E-01 |
| IQR | 7.43216E-04 | 1.88668E+01 | 5.37071E+04 | 9.34889E-04 | 2.16190E+01 | 3.18900E+03 | 3.04741E+02 | 5.46747E-03 | 2.07929E-01 |
|  |  |  |  |  | ***T* = 330 K** |  |  |  |  |
| true value | 1.50000E-05 | 5.01914E+00 | 1.00000E+04 | 3.94074E-04 | 2.51515E+00 | 6.86999E+02 | 8.00000E+01 | 1.03000E-03 | 5.55000E+02 |
| **DE** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.45306E-05 | 3.89436E+00 | 2.47670E+04 | 5.78041E-04 | 5.44376E+00 | 4.27040E+03 | 6.52316E+01 | 1.10383E-03 | 2.22987E-01 |
| MEDIAN | 1.73918E-06 | 3.39358E+00 | 2.56468E+03 | 4.54094E-04 | 4.29295E+00 | 7.60487E+02 | 4.38098E+01 | 1.08083E-03 | 1.82846E-01 |
| STD | 4.59785E-05 | 2.23582E+00 | 8.59814E+04 | 3.89995E-04 | 4.19410E+00 | 8.03184E+03 | 6.86059E+01 | 7.72389E-05 | 1.14500E-01 |
| IQR | 1.43496E-05 | 2.83764E+00 | 3.01045E+03 | 6.55659E-04 | 5.61193E+00 | 2.83648E+03 | 9.94062E+01 | 9.05259E-05 | 1.56753E-01 |
| **EBLSHADE** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.75078E-05 | 4.96861E+00 | 4.17918E+04 | 3.86868E-04 | 2.48324E+00 | 9.25031E+02 | 8.41984E+01 | 1.03766E-03 | 1.07256E-01 |
| MEDIAN | 1.49977E-05 | 5.01897E+00 | 9.99808E+03 | 3.94074E-04 | 2.51510E+00 | 6.86993E+02 | 8.00063E+01 | 1.03000E-03 | 9.95440E-02 |
| STD | 1.49573E-05 | 1.04815E+00 | 1.59351E+05 | 1.19518E-04 | 1.42077E+00 | 1.93935E+03 | 5.14499E+01 | 2.22986E-05 | 1.68043E-02 |
| IQR | 7.59136E-06 | 6.29958E-01 | 5.22619E+03 | 4.44594E-05 | 7.97547E-01 | 1.44843E+02 | 1.87124E+01 | 7.79881E-06 | 5.89057E-03 |
| **ADELI** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.49977E-05 | 5.01897E+00 | 9.99808E+03 | 3.94074E-04 | 2.51510E+00 | 6.86993E+02 | 8.00063E+01 | 1.03000E-03 | 9.95037E-02 |
| MEDIAN | 1.49977E-05 | 5.01897E+00 | 9.99808E+03 | 3.94074E-04 | 2.51510E+00 | 6.86993E+02 | 8.00063E+01 | 1.03000E-03 | 9.95037E-02 |
| STD | 2.58472E-14 | 1.79433E-09 | 2.14585E-05 | 5.01762E-14 | 1.22266E-09 | 1.68616E-07 | 8.63717E-08 | 8.75992E-19 | 4.20476E-17 |
| IQR | 4.50000E-14 | 3.00000E-09 | 3.40000E-05 | 1.00000E-13 | 2.00000E-09 | 2.50000E-07 | 1.35000E-07 | 0.00000E+00 | 0.00000E+00 |
| **NDE** |  |  |  |  |  |  |  |  |  |
| MEAN | 6.11227E-05 | 5.76490E+00 | 1.42779E+04 | 3.85317E-04 | 6.79009E+00 | 5.42006E+02 | 1.06737E+02 | 1.35544E-03 | 4.04987E-01 |
| MEDIAN | 1.50078E-05 | 5.01917E+00 | 9.99808E+03 | 3.94074E-04 | 2.63162E+00 | 6.86981E+02 | 8.00063E+01 | 1.03000E-03 | 9.95166E-02 |
| STD | 1.85101E-04 | 3.64751E+00 | 1.70935E+04 | 4.45975E-04 | 8.48920E+00 | 2.64055E+02 | 7.60261E+01 | 7.79399E-04 | 4.47829E-01 |
| IQR | 1.10713E-05 | 8.15665E-01 | 8.37131E+03 | 9.34878E-05 | 1.51087E+00 | 3.87830E+02 | 3.92110E+01 | 2.92655E-04 | 7.97824E-01 |
| **MABC** |  |  |  |  |  |  |  |  |  |
| MEAN | 5.39823E-05 | 5.67309E+00 | 2.17155E+04 | 7.60613E-04 | 5.39419E+00 | 3.76996E+03 | 9.74361E+01 | 1.15927E-03 | 3.77969E-01 |
| MEDIAN | 1.73048E-06 | 3.38347E+00 | 1.97362E+03 | 3.78054E-04 | 1.49757E+00 | 4.52821E+02 | 6.05965E+01 | 1.12335E-03 | 1.90273E-01 |
| STD | 1.01742E-04 | 4.61636E+00 | 5.53297E+04 | 1.02115E-03 | 7.17947E+00 | 1.03683E+04 | 1.04887E+02 | 1.42125E-04 | 3.37441E-01 |
| IQR | 6.00519E-05 | 6.12117E+00 | 5.11232E+03 | 6.35138E-04 | 7.10702E+00 | 3.85734E+02 | 1.20090E+02 | 1.54021E-04 | 4.74666E-01 |
| **TLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.62028E-05 | 5.08992E+00 | 6.21055E+04 | 3.95709E-04 | 2.56797E+00 | 6.94133E+02 | 7.65114E+01 | 1.02926E-03 | 9.95078E-02 |
| MEDIAN | 1.49977E-05 | 5.01897E+00 | 9.99808E+03 | 3.94074E-04 | 2.51510E+00 | 6.86993E+02 | 8.00063E+01 | 1.03000E-03 | 9.95037E-02 |
| STD | 4.33790E-06 | 2.53111E-01 | 2.09274E+05 | 8.23971E-06 | 2.29696E-01 | 3.14381E+01 | 1.34179E+01 | 2.58832E-06 | 1.53698E-05 |
| IQR | 3.00000E-14 | 2.00000E-09 | 2.45000E-05 | 1.00000E-13 | 2.00000E-09 | 3.00000E-07 | 1.25000E-07 | 0.00000E+00 | 0.00000E+00 |
| **GOTLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 9.37257E-05 | 7.10471E+00 | 6.70223E+04 | 5.29326E-04 | 1.07708E+01 | 3.56947E+03 | 4.72598E+01 | 1.15025E-03 | 4.60479E-01 |
| MEDIAN | 2.04085E-05 | 6.15577E+00 | 5.91727E+03 | 6.32428E-05 | 6.99296E+00 | 3.81620E+02 | 8.22560E+00 | 1.12897E-03 | 4.61259E-01 |
| STD | 1.76969E-04 | 5.58795E+00 | 1.69100E+05 | 8.20384E-04 | 9.11626E+00 | 8.85932E+03 | 7.57204E+01 | 1.35393E-04 | 2.91012E-01 |
| IQR | 1.08575E-04 | 6.47745E+00 | 3.28656E+04 | 7.59814E-04 | 1.40217E+01 | 5.37263E+02 | 5.89234E+01 | 1.67432E-04 | 5.24704E-01 |
| **STLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.49977E-05 | 5.01897E+00 | 9.99808E+03 | 3.94074E-04 | 2.51510E+00 | 6.86993E+02 | 8.00063E+01 | 1.03000E-03 | 9.95037E-02 |
| MEDIAN | 1.49977E-05 | 5.01897E+00 | 9.99808E+03 | 3.94074E-04 | 2.51510E+00 | 6.86993E+02 | 8.00063E+01 | 1.03000E-03 | 9.95037E-02 |
| STD | 2.26499E-14 | 1.70052E-09 | 1.95374E-05 | 5.40152E-14 | 1.05867E-09 | 1.62432E-07 | 7.70108E-08 | 8.75992E-19 | 4.20476E-17 |
| IQR | 3.50000E-14 | 2.00000E-09 | 2.90000E-05 | 1.00000E-13 | 1.50000E-09 | 3.00000E-07 | 1.00000E-07 | 0.00000E+00 | 0.00000E+00 |
| **PSO** |  |  |  |  |  |  |  |  |  |
| MEAN | 4.60127E-04 | 1.70258E+01 | 5.69538E+05 | 1.51389E-03 | 1.51710E+01 | 1.00330E+04 | 9.78458E+01 | 1.05787E-02 | 6.21580E-01 |
| MEDIAN | 3.85429E-05 | 2.73182E+01 | 1.00000E+06 | 5.04845E-04 | 8.31005E+00 | 4.55418E+02 | 1.00000E-01 | 1.12840E-03 | 8.35733E-01 |
| STD | 4.95539E-04 | 1.31314E+01 | 4.99142E+05 | 2.97363E-03 | 1.43395E+01 | 1.99360E+04 | 1.64276E+02 | 2.22018E-02 | 4.47494E-01 |
| IQR | 1.00000E-03 | 2.71327E+01 | 9.97390E+05 | 8.84969E-04 | 2.95000E+01 | 5.25256E+02 | 9.00247E+01 | 1.25410E-04 | 7.55484E-01 |
| **IJAYA** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.38133E-05 | 4.48901E+00 | 5.04708E+04 | 5.76225E-04 | 5.16229E+00 | 2.29083E+03 | 3.79302E+01 | 1.05043E-03 | 1.07312E-01 |
| MEDIAN | 9.12089E-06 | 4.51095E+00 | 4.70321E+03 | 4.99642E-04 | 4.81956E+00 | 9.89840E+02 | 5.08097E+00 | 1.03456E-03 | 1.02820E-01 |
| STD | 1.32242E-05 | 1.29283E+00 | 1.35368E+05 | 2.06684E-04 | 2.56985E+00 | 5.49333E+03 | 5.92073E+01 | 3.46902E-05 | 1.19947E-02 |
| IQR | 2.86775E-05 | 2.64207E+00 | 4.06013E+04 | 2.28061E-04 | 2.56737E+00 | 8.19351E+02 | 4.41926E+01 | 5.33229E-05 | 8.22927E-03 |
| **ISCA** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.26209E-04 | 1.14464E+01 | 5.94864E+04 | 1.38330E-03 | 1.33611E+01 | 1.69970E+03 | 5.82906E+01 | 1.22280E-03 | 6.39507E-01 |
| MEDIAN | 1.13127E-04 | 9.35167E+00 | 8.68900E+03 | 3.61387E-04 | 1.35306E+01 | 2.64162E+02 | 5.04152E+00 | 1.20421E-03 | 6.14736E-01 |
| STD | 2.43224E-04 | 6.56184E+00 | 1.36856E+05 | 2.32389E-03 | 8.45890E+00 | 4.50884E+03 | 8.83865E+01 | 1.23423E-04 | 2.76647E-01 |
| IQR | 3.68853E-04 | 1.25112E+01 | 5.22940E+04 | 1.40752E-03 | 1.30999E+01 | 3.31939E+02 | 1.03615E+02 | 1.85733E-04 | 3.45443E-01 |
| **NNA** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.63359E-04 | 1.20815E+01 | 3.09979E+04 | 5.55116E-04 | 1.65569E+01 | 1.52684E+03 | 3.60443E+01 | 2.93885E-03 | 9.88136E-01 |
| MEDIAN | 1.04304E-05 | 1.00021E+01 | 3.04719E+03 | 6.77431E-07 | 1.81328E+01 | 2.81254E+02 | 1.58449E+00 | 1.51113E-03 | 1.05385E+00 |
| STD | 2.62048E-04 | 9.07136E+00 | 7.59872E+04 | 1.53947E-03 | 8.81570E+00 | 7.09037E+03 | 7.03684E+01 | 4.21691E-03 | 3.19298E-01 |
| IQR | 1.97503E-04 | 1.71852E+01 | 1.50456E+04 | 9.03172E-05 | 1.64293E+01 | 3.01169E+02 | 4.01732E+01 | 1.19544E-03 | 5.90619E-01 |
| **CWOA** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.46426E-04 | 1.19620E+01 | 1.57158E+05 | 2.52922E-03 | 1.67977E+01 | 8.38181E+03 | 1.17385E+02 | 1.08732E-02 | 8.99587E-01 |
| MEDIAN | 8.04574E-07 | 5.93122E+00 | 4.02858E+02 | 6.82975E-08 | 1.67288E+01 | 3.87396E+02 | 1.61285E+01 | 1.81969E-03 | 1.18886E+00 |
| STD | 4.07629E-04 | 1.08393E+01 | 3.62591E+05 | 4.02230E-03 | 1.02405E+01 | 1.73997E+04 | 1.63622E+02 | 2.08707E-02 | 5.50075E-01 |
| IQR | 2.59201E-04 | 1.96042E+01 | 3.76037E+03 | 3.37860E-03 | 1.82677E+01 | 5.99772E+02 | 2.25262E+02 | 8.06087E-03 | 1.12231E+00 |
| **WW** |  |  |  |  |  |  |  |  |  |
| MEAN | 3.95696E-04 | 1.52501E+01 | 1.17694E+05 | 1.68950E-03 | 1.58443E+01 | 9.56900E+03 | 5.49070E+01 | 2.52344E-03 | 9.20130E-01 |
| MEDIAN | 2.68794E-04 | 1.44738E+01 | 5.51686E+03 | 2.00828E-04 | 1.33873E+01 | 2.59880E+02 | 9.46265E+00 | 1.28744E-03 | 9.28054E-01 |
| STD | 3.66344E-04 | 8.90406E+00 | 2.97119E+05 | 2.99688E-03 | 1.16357E+01 | 1.91461E+04 | 9.96093E+01 | 5.61169E-03 | 2.45900E-01 |
| IQR | 7.20546E-04 | 1.60080E+01 | 1.84651E+04 | 1.61225E-03 | 2.55228E+01 | 8.84961E+02 | 5.02754E+01 | 3.15797E-04 | 2.74302E-01 |
|  |  |  |  |  | ***T* = 340 K** |  |  |  |  |
| true value | 1.50000E-05 | 4.87151E+00 | 1.00000E+04 | 5.95785E-04 | 2.47059E+00 | 4.93568E+02 | 9.00000E+01 | 1.04000E-03 | 5.55000E+02 |
| **DE** |  |  |  |  |  |  |  |  |  |
| MEAN | 8.79836E-06 | 3.65610E+00 | 4.32122E+04 | 8.49896E-04 | 4.92352E+00 | 3.60831E+03 | 1.00566E+02 | 1.08551E-03 | 1.35532E-01 |
| MEDIAN | 2.84057E-06 | 3.55733E+00 | 3.59710E+03 | 7.54123E-04 | 3.33097E+00 | 5.94661E+02 | 9.01178E+01 | 1.06011E-03 | 1.17021E-01 |
| STD | 1.06895E-05 | 1.42220E+00 | 1.43409E+05 | 4.03068E-04 | 4.08878E+00 | 7.72464E+03 | 8.11411E+01 | 5.68810E-05 | 3.75107E-02 |
| IQR | 1.56516E-05 | 2.59431E+00 | 8.96510E+03 | 5.98051E-04 | 6.34835E+00 | 7.61002E+02 | 1.52281E+02 | 8.46358E-05 | 4.51257E-02 |
| **EBLSHADE** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.56192E-05 | 4.83515E+00 | 3.91746E+04 | 6.65425E-04 | 3.09205E+00 | 1.15850E+03 | 8.34612E+01 | 1.04287E-03 | 1.01161E-01 |
| MEDIAN | 1.49976E-05 | 4.87135E+00 | 9.99775E+03 | 5.95786E-04 | 2.47050E+00 | 4.93562E+02 | 9.00067E+01 | 1.04000E-03 | 9.95037E-02 |
| STD | 6.60123E-06 | 5.81929E-01 | 1.46878E+05 | 2.33913E-04 | 2.04792E+00 | 2.77162E+03 | 4.25142E+01 | 1.41186E-05 | 4.90941E-03 |
| IQR | 3.00000E-14 | 2.00000E-09 | 3.10000E-05 | 3.05100E-10 | 3.67700E-06 | 1.03980E-03 | 1.81758E-03 | 0.00000E+00 | 3.28653E-05 |
| **ADELI** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.49976E-05 | 4.87135E+00 | 9.99775E+03 | 5.95786E-04 | 2.47050E+00 | 4.93562E+02 | 9.00067E+01 | 1.04000E-03 | 9.95037E-02 |
| MEDIAN | 1.49976E-05 | 4.87135E+00 | 9.99775E+03 | 5.95786E-04 | 2.47050E+00 | 4.93562E+02 | 9.00067E+01 | 1.04000E-03 | 9.95037E-02 |
| STD | 1.75790E-14 | 1.20033E-09 | 1.44102E-05 | 1.58770E-13 | 1.88638E-09 | 2.36046E-07 | 7.01952E-08 | 4.37996E-19 | 2.80318E-17 |
| IQR | 3.00000E-14 | 2.00000E-09 | 2.00000E-05 | 2.00000E-13 | 2.50000E-09 | 3.50000E-07 | 9.50000E-08 | 0.00000E+00 | 0.00000E+00 |
| **NDE** |  |  |  |  |  |  |  |  |  |
| MEAN | 5.19566E-05 | 6.32741E+00 | 1.01777E+05 | 7.49865E-04 | 6.14737E+00 | 3.19477E+03 | 9.81832E+01 | 1.44226E-03 | 4.34404E-01 |
| MEDIAN | 1.49976E-05 | 4.87135E+00 | 9.44930E+03 | 5.94386E-04 | 2.49628E+00 | 4.86725E+02 | 9.19468E+01 | 1.04114E-03 | 9.95162E-02 |
| STD | 1.13956E-04 | 3.87363E+00 | 2.62762E+05 | 1.08270E-03 | 6.81281E+00 | 1.09933E+04 | 6.38884E+01 | 1.68412E-03 | 5.32427E-01 |
| IQR | 1.62475E-05 | 1.06716E+00 | 5.52351E+03 | 5.72239E-05 | 3.63839E+00 | 2.55027E+02 | 3.17248E+01 | 1.34534E-04 | 7.99543E-01 |
| **MABC** |  |  |  |  |  |  |  |  |  |
| MEAN | 3.05581E-05 | 4.98028E+00 | 1.49162E+04 | 8.47970E-04 | 5.32265E+00 | 1.73528E+03 | 7.46422E+01 | 1.13665E-03 | 3.43734E-01 |
| MEDIAN | 8.92925E-06 | 4.37730E+00 | 2.39072E+03 | 6.82367E-04 | 2.24432E+00 | 4.00197E+02 | 4.31606E+01 | 1.10525E-03 | 1.92311E-01 |
| STD | 7.52263E-05 | 2.99108E+00 | 5.44402E+04 | 8.74395E-04 | 6.76070E+00 | 4.91942E+03 | 7.94419E+01 | 1.22484E-04 | 2.88013E-01 |
| IQR | 2.23641E-05 | 2.59100E+00 | 2.86691E+03 | 7.54359E-04 | 5.55762E+00 | 9.20921E+02 | 1.24436E+02 | 1.28490E-04 | 3.67714E-01 |
| **TLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.53838E-05 | 4.89280E+00 | 1.25704E+04 | 6.15385E-04 | 2.64219E+00 | 6.40423E+02 | 8.70706E+01 | 1.03980E-03 | 9.95045E-02 |
| MEDIAN | 1.49976E-05 | 4.87135E+00 | 9.99775E+03 | 5.95786E-04 | 2.47050E+00 | 4.93562E+02 | 9.00067E+01 | 1.04000E-03 | 9.95037E-02 |
| STD | 2.68729E-06 | 1.57238E-01 | 1.84404E+04 | 1.16517E-04 | 9.77835E-01 | 9.97852E+02 | 1.74971E+01 | 1.61384E-06 | 4.14976E-06 |
| IQR | 3.50000E-14 | 2.50000E-09 | 2.85000E-05 | 2.50000E-13 | 3.00000E-09 | 4.00000E-07 | 1.35000E-07 | 0.00000E+00 | 0.00000E+00 |
| **GOTLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 7.05291E-05 | 6.29116E+00 | 6.24839E+04 | 1.21424E-03 | 1.05849E+01 | 1.63539E+03 | 5.38159E+01 | 1.14769E-03 | 4.18351E-01 |
| MEDIAN | 1.10034E-05 | 4.66909E+00 | 5.15583E+03 | 1.66807E-04 | 1.03613E+01 | 2.55793E+02 | 1.07162E+01 | 1.11812E-03 | 3.34591E-01 |
| STD | 1.20510E-04 | 4.33286E+00 | 1.66931E+05 | 2.15218E-03 | 7.87951E+00 | 4.68805E+03 | 8.00930E+01 | 1.49792E-04 | 2.63800E-01 |
| IQR | 9.38915E-05 | 6.34208E+00 | 1.31582E+04 | 1.05895E-03 | 1.27241E+01 | 2.87702E+02 | 7.69059E+01 | 1.25037E-04 | 4.79425E-01 |
| **STLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.49976E-05 | 4.87135E+00 | 9.99775E+03 | 5.95786E-04 | 2.47050E+00 | 4.93562E+02 | 9.00067E+01 | 1.04000E-03 | 9.95037E-02 |
| MEDIAN | 1.49976E-05 | 4.87135E+00 | 9.99775E+03 | 5.95786E-04 | 2.47050E+00 | 4.93562E+02 | 9.00067E+01 | 1.04000E-03 | 9.95037E-02 |
| STD | 2.36013E-14 | 1.58745E-09 | 1.95492E-05 | 1.84008E-13 | 2.30617E-09 | 2.92226E-07 | 9.85905E-08 | 4.37996E-19 | 2.80318E-17 |
| IQR | 3.00000E-14 | 2.00000E-09 | 2.80000E-05 | 2.00000E-13 | 3.00000E-09 | 3.50000E-07 | 1.60000E-07 | 0.00000E+00 | 0.00000E+00 |
| **PSO** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.21654E-04 | 7.60539E+00 | 6.08521E+05 | 2.63718E-03 | 1.83391E+01 | 8.99448E+03 | 1.20009E+02 | 8.55564E-03 | 3.69785E-01 |
| MEDIAN | 4.95093E-07 | 2.72447E+00 | 1.00000E+06 | 1.00000E-10 | 3.00000E+01 | 2.84474E+02 | 5.91392E+00 | 1.06647E-03 | 1.37158E-01 |
| STD | 4.12710E-04 | 1.00243E+01 | 4.92238E+05 | 4.19354E-03 | 1.41426E+01 | 1.91723E+04 | 1.47369E+02 | 2.37014E-02 | 4.72023E-01 |
| IQR | 5.71259E-05 | 3.98140E+00 | 9.98330E+05 | 3.14477E-03 | 2.95000E+01 | 4.15526E+02 | 2.85662E+02 | 1.83505E-04 | 7.52508E-02 |
| **IJAYA** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.54049E-05 | 4.63641E+00 | 5.41300E+04 | 8.56276E-04 | 5.61286E+00 | 1.57011E+03 | 3.83416E+01 | 1.05076E-03 | 1.06501E-01 |
| MEDIAN | 1.25971E-05 | 4.70015E+00 | 6.57438E+03 | 7.77851E-04 | 5.26519E+00 | 8.15414E+02 | 9.49987E+00 | 1.04056E-03 | 1.01111E-01 |
| STD | 1.20534E-05 | 1.01749E+00 | 1.20224E+05 | 2.73197E-04 | 2.51098E+00 | 2.81445E+03 | 4.94703E+01 | 2.19246E-05 | 1.32839E-02 |
| IQR | 2.32307E-05 | 1.92994E+00 | 2.01415E+04 | 2.51877E-04 | 3.19813E+00 | 4.57840E+02 | 6.33788E+01 | 3.31586E-05 | 7.69143E-03 |
| **ISCA** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.55178E-04 | 1.16722E+01 | 6.74738E+04 | 1.70713E-03 | 1.36118E+01 | 1.13345E+03 | 2.73746E+01 | 1.19290E-03 | 6.60133E-01 |
| MEDIAN | 2.14839E-04 | 1.18740E+01 | 1.28698E+04 | 2.07337E-04 | 1.32083E+01 | 1.60565E+02 | 3.69136E+00 | 1.15263E-03 | 6.57795E-01 |
| STD | 2.28558E-04 | 5.81717E+00 | 1.81817E+05 | 2.46664E-03 | 8.85857E+00 | 3.92061E+03 | 5.34016E+01 | 1.62653E-04 | 2.62856E-01 |
| IQR | 3.65748E-04 | 9.65155E+00 | 3.88236E+04 | 2.85296E-03 | 1.51416E+01 | 2.29861E+02 | 2.17020E+01 | 1.37760E-04 | 3.71118E-01 |
| **NNA** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.96823E-04 | 1.25891E+01 | 3.25799E+04 | 1.24805E-03 | 1.50060E+01 | 8.16217E+02 | 2.41474E+01 | 1.56126E-03 | 1.02250E+00 |
| MEDIAN | 2.77596E-05 | 1.03837E+01 | 1.53188E+03 | 1.28826E-06 | 1.46694E+01 | 1.03892E+02 | 1.15011E+00 | 1.25925E-03 | 1.00020E+00 |
| STD | 2.85104E-04 | 9.20725E+00 | 1.34996E+05 | 2.47821E-03 | 9.64705E+00 | 2.69099E+03 | 5.58393E+01 | 9.32773E-04 | 4.15987E-01 |
| IQR | 3.10832E-04 | 1.69993E+01 | 7.93101E+03 | 5.60656E-04 | 1.77378E+01 | 2.84312E+02 | 1.43782E+01 | 5.05524E-04 | 8.02560E-01 |
| **CWOA** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.35026E-04 | 9.96170E+00 | 1.19886E+05 | 2.12417E-03 | 1.51872E+01 | 4.68752E+03 | 1.09268E+02 | 1.63127E-02 | 9.94650E-01 |
| MEDIAN | 2.98697E-07 | 5.01116E+00 | 1.19836E+03 | 1.77957E-07 | 1.55980E+01 | 2.90983E+02 | 1.69384E+01 | 1.44070E-03 | 1.10043E+00 |
| STD | 3.84494E-04 | 9.69983E+00 | 3.22577E+05 | 3.65337E-03 | 9.89640E+00 | 1.34771E+04 | 1.47383E+02 | 2.88413E-02 | 6.49101E-01 |
| IQR | 2.84441E-04 | 1.39057E+01 | 5.93316E+03 | 3.66564E-03 | 1.72990E+01 | 3.30445E+02 | 2.38480E+02 | 9.50611E-03 | 1.40045E+00 |
| **WW** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.48175E-04 | 1.06628E+01 | 1.96112E+05 | 1.58121E-03 | 1.20454E+01 | 3.56004E+03 | 3.25340E+01 | 2.31363E-03 | 7.41655E-01 |
| MEDIAN | 4.99052E-05 | 7.05898E+00 | 4.60904E+03 | 1.29376E-04 | 6.28470E+00 | 2.23731E+02 | 6.46792E+00 | 1.18070E-03 | 8.16433E-01 |
| STD | 3.37471E-04 | 8.26648E+00 | 3.79195E+05 | 2.87210E-03 | 1.11226E+01 | 1.17953E+04 | 5.64323E+01 | 7.62385E-03 | 4.03780E-01 |
| IQR | 4.75198E-04 | 1.34104E+01 | 6.21178E+04 | 1.35656E-03 | 1.99688E+01 | 2.49973E+02 | 2.49406E+01 | 2.18951E-04 | 6.19593E-01 |
|  |  |  |  |  | ***T* = 350 K** |  |  |  |  |
| true value | 1.50000E-05 | 4.73233E+00 | 1.00000E+04 | 8.79718E-04 | 2.42857E+00 | 3.61363E+02 | 1.00000E+02 | 1.05000E-03 | 5.55000E+02 |
| **DE** |  |  |  |  |  |  |  |  |  |
| MEAN | 8.69397E-06 | 3.43654E+00 | 2.58081E+04 | 1.14107E-03 | 6.15066E+00 | 1.49222E+03 | 9.12705E+01 | 1.09968E-03 | 1.22682E-01 |
| MEDIAN | 5.41709E-07 | 2.70681E+00 | 2.17421E+03 | 9.53584E-04 | 4.58884E+00 | 3.40978E+02 | 8.89378E+01 | 1.10859E-03 | 1.17118E-01 |
| STD | 1.31687E-05 | 1.42887E+00 | 9.42210E+04 | 7.70324E-04 | 5.19901E+00 | 2.84500E+03 | 7.64629E+01 | 4.34113E-05 | 2.12294E-02 |
| IQR | 1.53139E-05 | 2.52440E+00 | 3.81052E+03 | 8.76618E-04 | 6.50400E+00 | 5.64781E+02 | 1.40120E+02 | 8.01679E-05 | 2.92000E-02 |
| **EBLSHADE** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.76605E-05 | 4.88026E+00 | 3.82528E+04 | 8.62261E-04 | 2.66469E+00 | 4.13813E+02 | 8.96591E+01 | 1.04911E-03 | 1.00169E-01 |
| MEDIAN | 1.50032E-05 | 4.73254E+00 | 1.00036E+04 | 8.79718E-04 | 2.42874E+00 | 3.61374E+02 | 9.99915E+01 | 1.05000E-03 | 9.95037E-02 |
| STD | 6.78709E-06 | 3.72693E-01 | 1.43101E+05 | 2.07871E-04 | 1.03168E+00 | 3.40682E+02 | 2.82531E+01 | 3.18981E-06 | 1.90530E-03 |
| IQR | 3.00000E-14 | 2.00000E-09 | 2.00000E-05 | 1.35000E-12 | 5.00000E-09 | 9.50000E-07 | 1.75000E-07 | 0.00000E+00 | 0.00000E+00 |
| **ADELI** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.50032E-05 | 4.73254E+00 | 1.00036E+04 | 8.79718E-04 | 2.42874E+00 | 3.61374E+02 | 9.99915E+01 | 1.05000E-03 | 9.95037E-02 |
| MEDIAN | 1.50032E-05 | 4.73254E+00 | 1.00036E+04 | 8.79718E-04 | 2.42874E+00 | 3.61374E+02 | 9.99915E+01 | 1.05000E-03 | 9.95037E-02 |
| STD | 1.76302E-14 | 1.29645E-09 | 1.54869E-05 | 8.07922E-13 | 4.86000E-09 | 5.93461E-07 | 1.07962E-07 | 6.56994E-19 | 4.20476E-17 |
| IQR | 3.00000E-14 | 2.00000E-09 | 2.00000E-05 | 1.25000E-12 | 7.50000E-09 | 9.00000E-07 | 1.55000E-07 | 0.00000E+00 | 0.00000E+00 |
| **NDE** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.14512E-05 | 4.81662E+00 | 1.04285E+04 | 1.14885E-03 | 6.32159E+00 | 1.36983E+03 | 7.88813E+01 | 1.10430E-03 | 2.34604E-01 |
| MEDIAN | 1.50032E-05 | 4.73254E+00 | 1.00036E+04 | 8.79718E-04 | 2.42932E+00 | 3.61374E+02 | 9.99893E+01 | 1.05000E-03 | 9.95046E-02 |
| STD | 3.70972E-05 | 1.67544E+00 | 6.54716E+03 | 1.22991E-03 | 6.91420E+00 | 3.79787E+03 | 3.39401E+01 | 1.54948E-04 | 3.51097E-01 |
| IQR | 4.48012E-06 | 3.07542E-01 | 3.79454E+03 | 3.58447E-04 | 4.86176E+00 | 2.12881E+02 | 4.00536E+01 | 4.36090E-06 | 2.15188E-05 |
| **MABC** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.30593E-05 | 4.20685E+00 | 5.03637E+04 | 9.30677E-04 | 7.43217E+00 | 9.34217E+02 | 6.84413E+01 | 1.15569E-03 | 2.03232E-01 |
| MEDIAN | 3.56101E-06 | 3.58582E+00 | 3.21006E+03 | 4.51102E-04 | 3.12914E+00 | 2.41633E+02 | 2.99907E+01 | 1.07626E-03 | 1.16524E-01 |
| STD | 5.84140E-05 | 2.65468E+00 | 1.56967E+05 | 1.44826E-03 | 8.28260E+00 | 2.76505E+03 | 7.66201E+01 | 4.11432E-04 | 2.55094E-01 |
| IQR | 2.23295E-05 | 3.10343E+00 | 1.00377E+04 | 1.06199E-03 | 9.60657E+00 | 1.87791E+02 | 1.19346E+02 | 9.81028E-05 | 4.82567E-02 |
| **TLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.56730E-05 | 4.76234E+00 | 1.08441E+04 | 1.03596E-03 | 3.20617E+00 | 3.32055E+03 | 9.26285E+01 | 1.04986E-03 | 9.95092E-02 |
| MEDIAN | 1.50032E-05 | 4.73254E+00 | 1.00036E+04 | 8.79718E-04 | 2.42874E+00 | 3.61374E+02 | 9.99915E+01 | 1.05000E-03 | 9.95037E-02 |
| STD | 3.25043E-06 | 2.51594E-01 | 2.68810E+03 | 3.74343E-04 | 1.95642E+00 | 9.48578E+03 | 2.73570E+01 | 3.85660E-06 | 2.34852E-05 |
| IQR | 6.50000E-14 | 4.50000E-09 | 5.00000E-05 | 2.55000E-12 | 1.40000E-08 | 1.95000E-06 | 3.90000E-07 | 1.00000E-12 | 5.79900E-08 |
| **GOTLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 8.54154E-05 | 6.75483E+00 | 7.62391E+04 | 9.60102E-04 | 1.30100E+01 | 8.50839E+02 | 3.61071E+01 | 1.12442E-03 | 3.83567E-01 |
| MEDIAN | 1.65454E-05 | 5.07993E+00 | 7.12981E+03 | 5.27489E-05 | 1.21436E+01 | 1.72948E+02 | 4.66429E+00 | 1.10108E-03 | 3.10471E-01 |
| STD | 1.20562E-04 | 4.04633E+00 | 2.03734E+05 | 1.92009E-03 | 9.04385E+00 | 2.68740E+03 | 5.87908E+01 | 1.02163E-04 | 2.63264E-01 |
| IQR | 1.53143E-04 | 6.63110E+00 | 3.53413E+04 | 1.08914E-03 | 1.34751E+01 | 1.86087E+02 | 4.67860E+01 | 6.56280E-05 | 4.41560E-01 |
| **STLBO** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.50032E-05 | 4.73254E+00 | 1.00036E+04 | 8.79718E-04 | 2.42874E+00 | 3.61374E+02 | 9.99915E+01 | 1.05000E-03 | 9.95037E-02 |
| MEDIAN | 1.50032E-05 | 4.73254E+00 | 1.00036E+04 | 8.79718E-04 | 2.42874E+00 | 3.61374E+02 | 9.99915E+01 | 1.05000E-03 | 9.95037E-02 |
| STD | 2.22781E-14 | 1.63515E-09 | 2.00841E-05 | 1.16780E-12 | 6.68085E-09 | 8.41544E-07 | 1.40198E-07 | 2.37635E-13 | 4.20476E-17 |
| IQR | 3.00000E-14 | 2.50000E-09 | 3.00000E-05 | 1.65000E-12 | 1.00000E-08 | 1.25000E-06 | 2.00000E-07 | 0.00000E+00 | 0.00000E+00 |
| **PSO** |  |  |  |  |  |  |  |  |  |
| MEAN | 7.25675E-05 | 5.02539E+00 | 5.11025E+05 | 3.33443E-03 | 1.95109E+01 | 1.39492E+04 | 1.45821E+02 | 1.28303E-02 | 4.38373E-01 |
| MEDIAN | 3.23114E-06 | 3.46955E+00 | 5.06623E+05 | 2.10611E-04 | 3.00000E+01 | 1.24223E+02 | 1.35643E+02 | 1.04811E-03 | 1.28175E-01 |
| STD | 2.41560E-04 | 6.45878E+00 | 5.03626E+05 | 4.30218E-03 | 1.29049E+01 | 2.24223E+04 | 1.40544E+02 | 2.67301E-02 | 6.33459E-01 |
| IQR | 9.41973E-06 | 2.62292E+00 | 9.98589E+05 | 1.00000E-02 | 2.78744E+01 | 4.99897E+04 | 2.34377E+02 | 1.68255E-04 | 3.61187E-02 |
| **IJAYA** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.43859E-05 | 4.46263E+00 | 3.48681E+04 | 1.30829E-03 | 7.82133E+00 | 1.91100E+03 | 3.77466E+01 | 1.06194E-03 | 1.05522E-01 |
| MEDIAN | 1.24540E-05 | 4.57213E+00 | 5.25571E+03 | 1.14765E-03 | 7.56814E+00 | 6.10271E+02 | 7.61560E+00 | 1.05579E-03 | 1.01940E-01 |
| STD | 1.05876E-05 | 9.28048E-01 | 1.24185E+05 | 5.39619E-04 | 4.34077E+00 | 5.55987E+03 | 5.83388E+01 | 2.29665E-05 | 8.17914E-03 |
| IQR | 1.75718E-05 | 1.44702E+00 | 1.39039E+04 | 8.14092E-04 | 6.11684E+00 | 6.08394E+02 | 4.41557E+01 | 3.08393E-05 | 7.09278E-03 |
| **ISCA** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.50131E-04 | 8.89807E+00 | 1.05563E+05 | 1.66180E-03 | 1.26885E+01 | 1.02562E+03 | 1.85482E+01 | 1.16642E-03 | 6.40744E-01 |
| MEDIAN | 1.02769E-04 | 8.64490E+00 | 8.75361E+03 | 2.95090E-04 | 1.20682E+01 | 1.60420E+02 | 3.87085E+00 | 1.13401E-03 | 6.56746E-01 |
| STD | 1.46524E-04 | 4.20787E+00 | 2.05815E+05 | 2.57694E-03 | 7.86932E+00 | 2.84644E+03 | 2.83567E+01 | 1.02773E-04 | 2.73669E-01 |
| IQR | 2.03003E-04 | 6.41871E+00 | 9.58805E+04 | 2.42769E-03 | 1.25917E+01 | 2.60129E+02 | 1.85336E+01 | 1.35898E-04 | 4.19912E-01 |
| **NNA** |  |  |  |  |  |  |  |  |  |
| MEAN | 1.26054E-04 | 9.98644E+00 | 3.29076E+04 | 7.01347E-04 | 1.53889E+01 | 3.75533E+02 | 2.62488E+01 | 1.82813E-03 | 8.34411E-01 |
| MEDIAN | 2.01088E-05 | 7.29681E+00 | 2.34230E+03 | 1.62772E-06 | 1.44230E+01 | 1.02973E+02 | 1.74503E+00 | 1.16825E-03 | 7.94328E-01 |
| STD | 1.96453E-04 | 7.54130E+00 | 1.04300E+05 | 2.00796E-03 | 8.35224E+00 | 1.19007E+03 | 5.34795E+01 | 3.35504E-03 | 4.65190E-01 |
| IQR | 2.19288E-04 | 1.02398E+01 | 1.93101E+04 | 7.10653E-05 | 1.34784E+01 | 1.88704E+02 | 2.92703E+01 | 3.06791E-04 | 5.98379E-01 |
| **CWOA** |  |  |  |  |  |  |  |  |  |
| MEAN | 3.07406E-04 | 1.16799E+01 | 8.55418E+04 | 2.30518E-03 | 1.55286E+01 | 3.57714E+03 | 8.52064E+01 | 1.13903E-02 | 9.48378E-01 |
| MEDIAN | 2.08594E-05 | 5.76655E+00 | 1.40068E+03 | 1.47191E-05 | 1.56516E+01 | 2.52279E+02 | 8.12653E+00 | 1.26817E-03 | 9.98901E-01 |
| STD | 4.19368E-04 | 1.02479E+01 | 2.70365E+05 | 3.71354E-03 | 1.05186E+01 | 1.18680E+04 | 1.22897E+02 | 2.46765E-02 | 7.48635E-01 |
| IQR | 6.88717E-04 | 1.71049E+01 | 4.39332E+03 | 2.28832E-03 | 2.06732E+01 | 3.39655E+02 | 1.50975E+02 | 5.18315E-03 | 1.65244E+00 |
| **WW** |  |  |  |  |  |  |  |  |  |
| MEAN | 2.75714E-04 | 1.09139E+01 | 2.74259E+05 | 4.00199E-03 | 1.03581E+01 | 5.08693E+03 | 5.04411E+01 | 1.38793E-03 | 8.71434E-01 |
| MEDIAN | 9.77243E-05 | 8.34191E+00 | 7.01043E+03 | 1.64437E-03 | 7.66904E+00 | 1.07109E+02 | 1.62179E+01 | 1.18914E-03 | 8.46548E-01 |
| STD | 3.45977E-04 | 7.80210E+00 | 4.31976E+05 | 4.22991E-03 | 1.00880E+01 | 1.49616E+04 | 6.79048E+01 | 9.43810E-04 | 4.00295E-01 |
| IQR | 4.33127E-04 | 1.11635E+01 | 6.58580E+05 | 9.77137E-03 | 1.61542E+01 | 1.93634E+02 | 9.05761E+01 | 2.32756E-04 | 6.04344E-01 |