彈性碰撞

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 小氣軌車質量m1 | | | 大氣軌車質量m2 | | | | |  | |  | |
| 0.21272 | | | 0.3112 | | | | |  | |  | |
| 小車撞大車 | |  |  | | |  | |  | | e | |
|  |
|  |
| 1 | 0.428 | | | -0.093 | | 0.478 | | 1.334112 | |  |
| 2 | 0.52 | | | -0.086 | | 0.414 | | 0.961538 | |  |
| 3 | 0.606 | | | -0.115 | | 0.479 | | 0.980198 | |  |
| 4 | 0.481 | | | -0.101 | | 0.473 | | 1.193347 | |  |
| 5 | 0.444 | | | -0.086 | | 0.35 | | 0.981982 | |  |
| 驗證公式(6) | | | | | | | 驗證公式(7) | | | | | | | |
|  |  | | | 百分誤差 | 誤差 平均值 | |  | |  | | 百分誤差 | | | 誤差 平均值 |
|  |
| -0.21729 | -0.18797 | | | 16% | 9% | | 1.116822 | | 0.812032 | | 38% | | | 13% |  |
| -0.16538 | 12% | 0.796154 | | 2% | | |  |
| -0.18977 | 1% | 0.790429 | | 3% | | |  |
| -0.20998 | 12% | 0.983368 | | |  | | --- | | 21% | | | |  |
| -0.19369 | 3% | 0.788288 | | 3% | | |  |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 大氣軌車質量m1 | | | 小氣軌車質量m2 | | | | |  | |  | |
| 0.3112 | | | 0.21272 | | | | |  | |  | |
| 大車撞小車 | |  |  | | |  | |  | | e | |
|  |
|  |
| 1 | 0.411 | | | 0.07 | | 0.479 | | 0.995134 | |  |
| 2 | 0.566 | | | 0.089 | | 0.663 | | 1.014134 | |  |
| 3 | 0.482 | | | 0.081 | | 0.565 | | 1.004149 | |  |
| 4 | 0.498 | | | 0.076 | | 0.582 | | 1.016064 | |  |
| 5 | 0.521 | | | 0.082 | | 0.597 | | 0.988484 | |  |
| 驗證公式(6) | | | | | | | 驗證公式(7) | | | | | | | |
|  |  | | | 百分誤差 | 誤差 平均值 | |  | |  | | 百分誤差 | | | 誤差 平均值 |
|  |
| 0.170316 | 0.187968 | | | 9% | 14% | | 1.16545 | | 1.187968 | | 2% | | | 2% |  |
| 0.157244 | 16% | 1.171378 | | 1% | | |  |
| 0.16805 | 11% | 1.172199 | | 1% | | |  |
| 0.15261 | 19% | 1.168675 | | 2% | | |  |
| 0.15739 | 16% | 1.145873 | | 4% | | |  |

完全非彈性碰撞

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 小氣軌車質量m1 | | 大氣軌車質量m2 | |  |  |  |  | |  | | --- | |  | |  |
| 0.2123 | | 0.3116 | |  |  |  |  |  |  |
| 小車撞大車 |  |  |  |  | e | 驗證公式(6) | | | |
|  |  | 百分誤差 | 誤差 平均值 |
|  |
| 1 | 0.444 | 0.18 | 0.178 | -0.0045 | 0.405405 | 0.40523 | 0% | 2% |  |
| 2 | 0.425 | 0.168 | 0.166 | -0.00471 | 0.395294 | 2% |  |
| 3 | 0.4 | 0.16 | 0.16 | 0 | 0.4 | 1% |  |
| 4 | 0.499 | 0.19 | 0.193 | 0.006012 | 0.380762 | 6% |  |
| 5 | 0.482 | 0.193 | 0.192 | -0.00207 | 0.400415 | 1% |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 大氣軌車質量m1 | | 小氣軌車質量m2 | |  |  |  |  |  |  |
| 0.3112 | | 0.21179 | |  |  |  |  |  |  |
| 大車撞小車 |  |  |  |  | e | 驗證公式(6) | | | |
|  |  | 百分誤差 | 誤差 平均值 |
|  |
| 1 | 0.401 | 0.236 | 0.237 | 0.002494 | 0.588529 | 0.59504 | 1% | 3% |  |
| 2 | 0.502 | 0.299 | 0.3 | 0.001992 | 0.595618 | 0% |  |
| 3 | 0.329 | 0.174 | 0.184 | 0.030395 | 0.528875 | 11% |  |
| 4 | 0.509 | 0.3 | 0.302 | 0.003929 | 0.589391 | 1% |  |
| 5 | 0.46 | 0.268 | 0.271 | 0.006522 | 0.582609 | 2% |  |

誤差來源:

推車速度不一、過快或過慢，使誤差加劇。

氣軌氣流不均、氣軌歪掉、推車底座造成氣流產生預料外的推力。

橡皮筋老化、受力不往質心產生力矩、儀器誤差

