

ABSTRAK

PENGUKURAN NILAI KOEFISIEN RESTITUSI DAN BERLAKUNYA HUKUM KEKALKAN MOMENTUM PADA TUMBUKAN TAK SENTRAL MENGGUNAKAN APLIKASI TRACKER

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Telah dilakukan penelitian untuk mengukur nilai koefisien restitusi dan berlakunya momentum pada tumbukan tak sentral dua koin karambol dengan menggunakan metode perekaman video dan dianalisa menggunakan aplikasi *Tracker*. Penelitian dilakukan dengan tiga variasi yaitu massa koin, kecepatan awal koin dan sudut hambur koin kedua setelah tumbukan terhadap nilai koefisien restitusi. Peristiwa tumbukan tak sentral kemudian direkam dan dianalisis menghasilkan grafik hubungan antara posisi terhadap waktu dan nilai sudut hambur dua koin setelah bertumbukan menggunakan aplikasi *Tracker*. Grafik tersebut digunakan untuk memperoleh nilai kecepatan koin sebelum dan sesudah bertumbukan dengan cara disesuaikan berdasarkan persamaan fungsi linear. Hasil penelitian menunjukkan bahwa massa koin tidak mempengaruhi nilai koefisien restitusi dan sedangkan nilai sudut hambur koin kedua setelah tumbukan diperbesar mengakibatkan nilai koefisien restitusi semakin besar. Selain itu apabila nilai kecepatan awal koin pertama bergerak semakin besar maka mengakibatkan nilai koefisien restitusi akan semakin kecil. Dari hasil momentum yang diperoleh menunjukkan hukum kekekalan momentum berlaku pada tumbukan tak sentral.

Kata kunci: Tumbukan tak sentral, koin karambol, koefisien restitusi, momentum, video, *Tracker*.

ABSTRACT

MEASUREMENT THE VALUE OF THE COEFFICIENT OF RESTITUTION AND THE EFFECT OF THE LAW OF CONSERVATION MOMENTUM ON NON-CENTRAL COLLISION USING THE TRACKER APPLICATION

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Research has been carried out to measure the value of the coefficient of restitution and the effect of momentum on the noncentral collision of two carrom coins using the video recording method and analyzed using the Tracker application. The research was conducted with three variations, namely the mass of the coin, the initial velocity of the coin and the angle of scattering of the second coin after the collision to the value of the coefficient of restitution. The non-central collision event is then recorded and analyzed to produce a graph of the relationship between position against time and the value of the scattering angle of the two coins after the collision using the Tracker application. The graph is used to obtain the value of the velocity of the coin before and after the collision by adjusting it based on the equation of a linear function. The results showed that the mass of the coin did not affect the value of the coefficient of restitution and while the value of the scattering angle of the second coin after the collision was enlarged, the value of the coefficient of restitution was greater. In addition, if the value of the initial velocity of the first coin moves is greater then the value of the coefficient of restitution will be smaller. From the momentum results obtained, it shows that the law of conservation of momentum applies to non-central collisions.

Keywords: non-central collision, carrom coin, coefficient of restitution, momentum, video, Tracker.