

Re: moment of inertia of a cube

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- *From:* "Androcles" <Engineer@xxxxxxxxxxxxxxxxxxxxxxxxxxxx>
 - *Date:* Fri, 30 Mar 2007 23:49:45 GMT
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"Uncle Al" <UncleAl0@xxxxxxxxxxxxxx> wrote in message
news:460D84B6.49750EE3@xxxxxxxxxxxxxxxxxxxx

"John C. Polasek" wrote:

On 29 Mar 2007 22:05:37 -0700, bob@xxxxxxxxxxxxxxxxxx wrote:

I calculated today that the moment of inertia of a cube does not depend on the axis of rotation. Is there a real intuitive way to see this?

Thank you.

It would be interesting to see how you calculated that fact. But it is true and can be proved trivially.

J is a 2d rank tensor for a cube $J_{11}=J_{22}=J_{33}$ so we J is equal to the scalar j x the identity tensor I.

The similarity transform for a 2d rank tensor T is A^*TA where A and A^* are cosine rotation matrices for angle a and $-a$. Thus for any rotation a about (any) axis (compound or principal is OK)

$$J' = A^*JA = A^*IA = A^*A = I = J$$

Thus the rotations have no effect on the cube tensor.

John Polasek

What about the right circular cylinder of height=(radius)[sqrt(3)]?
Get funky!

Re: moment of inertia of a cube

Ok. How funky is this?

"Dirk Van de moortel" <dirkvandemoortel@xx> wrote in message [news:A6Brg.524499\\$wo6.12916828@xx](mailto:news:A6Brg.524499$wo6.12916828@xx)

|
| <cafeinst@xxxxxxx> wrote in message
news:1152307942.372579.246730@xx

| > I can't find any problems with your math

|
| Never mind the math, check the physics.

Or this:

"Tom Roberts" <tjroberts@xxxxxxxxxxx> wrote in message
[news:hG3Sf.54263\\$H71.9335@xx](mailto:news:hG3Sf.54263$H71.9335@xx)

| GSS wrote:

| > Tom Roberts wrote:

| >> I repeat: that is not really "speed".

| > Let us elaborate this point.

|
| Imagine a train leaving one city at 12:00 and arriving in a city 60
| miles to its west at 12:01. Do you really think that train traveled
| 3,600 miles per hour? Of course not! This example used two different
| coordinate systems for "time", the two timezones of those two cities. To
| obtain the speed you must use a single coordinate system; then you'll
| realize it traveled just under 60 miles per hour.

|
|
| > If a time interval *dt* is measured by using UTC (or TAI) time
| > standards in reference frames K1, K2, K3 etc. in relative motion within
| > our solar system, will you regard this time interval as real or not
| > real?

|
| "real" has nothing to do with it.

|
| > If a distance interval *ds* is measured by using a standard meter rod
| > as per SI standards in reference frames K1, K2, K3 etc. in relative
| > motion within our solar system, will you regard this distance interval
| > as real or not real?

|
| "Real" has nothing to do with it.

|
| To obtain a speed, you must divide the distance traveled by the travel
| time, and all quantities must be measured in a single coordinate
| system. In Newtonian mechanics and SR, the coordinate system must be
| inertial, using standard clocks and rulers. In GR (or other coordinate
| systems) this merely yields coordinate speed.

|
| Nothing else is speed. Because that is what we mean by the word. <shrug>

Re: moment of inertia of a cube

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|
| Tom Roberts tjroberts@xxxxxxxxxx

Or this:

"BTW, you fuck-faced baboon, "(c+v) appears nowhere in the paper, nor could it. Hey Androcyst, you are an ineducable idiot. Your high school should be leveled and replaced by an abandoned bowling alley." --Schwartz the fucking imbecile.

Ya gotta love "nor could it".

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