

# Re: Two vectors, two coordinate systems

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  - *Date:* Thu, 29 May 2008 19:17:33 +0100
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<animalover1@xxxxxxx> wrote in message  
[news:65480d7f-8b9b-4582-9166-5561cfb3a5c8@xx](mailto:news:65480d7f-8b9b-4582-9166-5561cfb3a5c8@xx)

| I have a question that I would like to ask the group given. This is  
| not a homework problem, but I am trying to figure  
| out how to determine the angle between two cables attached to two  
| rigid structures. Please let me explain what I am talking about. I  
| have two vectors (2 cables attached to a fixed beam – they will  
| always  
| have tension and will never deform out of shape of a line) and the  
| other end they both are attached to a non-fixed box (I guess you can  
| think of it as rubber cords on the wall attached to a box). I will  
| always know the orientation of one cable (CABLE A) that is, the angle  
| relative to the box (coordinate system of the box). I know the  
| INITIAL angle of the second cable (CABLE B), however, the angle is  
| the  
| angle relative to the beam. I would like to know if there is a way to  
| solve the angle of CABLE B in the boxes coordinate system at 1) the  
| initial position and 2) if the box is moved to a new location. This  
| seems like it would be simple, but I don't know how to solve this.  
| So, I started it by trying to transform the vector of CABLE B into  
| the  
| coordinate system of the box (going from the fixed beam to the box).  
| I think that would give me the initial position/angle of CABLE B in  
| the boxes coordinate system. I really do not know how to write the  
| transformation matrix to do this, but think it would be something

| CABLE B  
| X  
| Y \* [Rotation Matrix] = CABLE B's new XYZ coordinates  
| Z

| Then how would I need to get the angels with respect to the boxes  
| coordinate system?  
| Then if the box moves, how would this all work as well? Please help!

Re: Two vectors, two coordinate systems

What you need is a translation matrix combined with a rotation matrix.

<http://www.kwon3d.com/theory/transform/transform.html>

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Why did Einstein say

the speed of light from A to B is  $c-v$ ,

the speed of light from B to A is  $c+v$ ,

the "time" each way is the same?

$$1/2[\tau(A)+\tau(A')]=\tau(B)$$

where

$$A = (0,0,0,t)$$

$$A' = (0,0,0,t+x'/(c-v) +x'/(c+v))$$

$$B = (x',0,0,t+x'/(c-v))$$

$$x' = x-vt$$

Ref: <http://www.fourmilab.ch/etexts/einstein/specrel/www/figures/img22.gif>

"Easy. He did not say that." – cretin van lintel.

Androcles