Dear FLUKA experts:

I’m a new Fluka user, I have a question in describing a beam. I have two questions. Firstly I don’t understand the example in page 78 of the user manual as follows:

Example:

\* The next option cards describe a 10 GeV’ proton beam with a divergence of

\* 50 mrad and a gaussian profile in the "beam x"-direction and in the

\* "beam y"-direction described by standard deviations sigma\_x = 1. cm

\* (FWHM = 2.36 cm) and sigma\_y = 0.5 cm (FWHM = 1.18 cm). The beam starts

\* from point (0,0,0) and is directed in a direction perpendicular to the

\* "geometry x" axis, at 45 degrees with respect to both "geometry y" and

\* "geometry z". The "beam x" axis has cosines 1,0,0 and the "beam z"

\* axis has cosines 0, cos(pi/4), cos(pi/4)

\*...+....1....+....2....+....3....+....4....+....5....+....6....+....7....+...

BEAM -10.0 0.0 50.0 -2.36 -1.18 1.0 PROTON

BEAMPOS 0.0 0.0 0.0 0.0 0.7071068 0.0

BEAMAXES 1.0 0.0 0.0 0.0 0.7071068 0.7071068

My question is, “beam z” axis is exactly the beam direction, why WHAT(5) (direction cosine of the beam with respect to the y-axis of the beam reference frame) in “BEAMPOS” is 0.7071068? I think it should be 0. I’m really confused with it, could you please answer me the question?

My second question is:

I want to describe a 1GeV proton with a guass profile in the geometry y-direction described by standard deviations sigma\_y = 1cm, the beam starts from point(0,0,0) and is perpendicular to the "geometry x" axis, and at 60 and 30 degrees with respect to "geometry y" and "geometry z".

My description is:

BEAM -1 0 0 0 -2.36 1.0 PROTON

BEAMPOS 0.0 0.0 0.0 0.0 0.5 0.0

BEAMAXES 1.0 0.0 0.0 0 0 1

In fact, I define the beam reference frame exactly the same with the geometry frame, and then I define the beam direction with BEAMPOS. Is it correct? I really need your help. Thank you very much.