V^0 decays and their lines of flight

In the picture below there are two vees. It is obvious that the wide one on the left cannot be coming from the link, but what about the narrower one downstream?
There is a simple procedure that can be applied: print off the event and then use a ruler to join the point where the vees tracks cross to the vee decay point; follow this line back and you will find that this line points to the kink.

What is the justification for this procedure?

Consider the simplified case where a V^0 enters and decays, at X, in a plane perpendicular to field B, which is into the page. There are two decay products, one positive and the other negative. The negative decay product has momentum p, at an angle θ to the original path of the neutral particle. The negative particle then moves through the magnetic field in a circular path of radius R and crosses the original path of the neutral particle again at point Y. What is the length L of the line XY? We will show that L is proportional to $p_\perp$. Then, since by momentum conservation the positive and negative tracks from a vee have the same $p_\perp$, L will be the same for both, and our rule for finding where vees come from will be justified.
The component of the momentum perpendicular to the original path of the neutral particle, $p_\perp$ is given by:

$$p_\perp = p \sin\theta \implies \sin\theta = \frac{p_\perp}{p}$$

But from similar triangles:

$$\sin\theta = \frac{\left(\frac{L}{2}\right)}{R} = \frac{L}{2R} \implies L = \frac{2R}{p} p_\perp$$

But the radius of curvature R is determined only by the momentum of the particle and the strength of the magnetic field:

$$Bqv = \frac{mv^2}{R} \implies p = (Bq)R$$

so

$$L = \frac{2R}{BqR} p_\perp = \left(\frac{2}{Bq}\right) p_\perp$$

as required.