Final Results of Parameter Analysis

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Basic Review of Parameter Analysis

Use Bayes' equation to calculate relative probabilities for three hypothesis for each tau and charm candidate.

$$P(i) = \frac{PP_i \Pi(i)}{PP_i \Pi(i) + \Sigma_{bkg} PP_{bkg} \Pi(bkg)} \qquad (1)$$

where i is either a tau neutrino event, a charm event, or a hadronic interaction, and the background term, $\Sigma_{bkg} PP_{bkg} \Pi(bkg)$, is the sum over the other two possibilities. PP_i is the prior probabilty of the event being an i type event, which is calculated. $\Pi(i)$ is the probabilty density function, which is evaluated using simulated events of each type.

Results

Event	P(τ)	P(c)	P(h)	Material
3024_30175	0.67	0.33	0.00	Plastic
3039_01910	0.98	0.02	0.00	Plastic
3263_25102	0.14	0.27	0.59	Iron
3296_18816	0.72	0.23	0.05	Emulsion
3333_17665	0.98	0.02	0.00	Plastic
3334_19920	0.999	0.002	0.00	Plastic
2986_00355	0.00	0.999	0.001	Emulsion
3065_03238	0.00	0.89	0.11	Iron
3073_22977	0.00	0.99	0.01	Emulsion
3193_01361	0.00	0.97	0.03	Iron
3245_22786	0.00	0.94	0.06	Emulsion

According to this analysis, there are 5 tau candidate, 5 charm candidates, and 1 interaction candidate.