

MC truth

# Reconstructed tau decay modes

### each reconstructed decay

## sum of all entries for each MC decay

#### $\pi$ $\rho$ $a_{1-1p}$ $a_{1-3p}$ eμ

eff=



4

	reconstructed tau decay mode								$m_{\tau\tau} > 240 {\rm GeV}$
OLD	[%]	pi	rho	a11p	a13p	е	mu	unknown	
Z	pi	65.41	12.03	0.00	1.50	4.51	0.75	15.79	MC - reco m
	rho	0.34	48.28	17.59	5.86	3.45	0.69	23.79	
$\cap$	a11p	0.82	5.74	69.67	4.92	5.74	0.82	12.30	λ
truth	a13p	0.00	0.86	0.00	72.41	0.00	0.00	26.72	IV;
	e	0.45	0.45	0.90	0.90	73.87	1.35	22.07	$i  \epsilon = -$
	mu	1.33	0.00	0.88	1.77	0.00	80.53	15.49	$\int U \nabla N$
	other	0.00	2.11	14.74	42.11	1.05	0.00	40.00	
i	reconstructed tau decay mode								J
J			rec	onstruc	ted tau	decay n	node	$\checkmark$	
	[%]	pi	rec rho	onstruc a11p	ted tau a13p	decay n e	node mu	unknown	
NEW	[%] pi	pi 75.39	rec rho 11.97	onstruc a11p 0.50	ted tau a13p 3.18	decay n e 5.45	node mu 1.94	unknown 1.56	
NEW ≤	[%] pi rho	pi 75.39 3.67	rec rho 11.97 72.37	onstruc a11p 0.50 8.81	ted tau a13p 3.18 4.72	decay n e 5.45 5.94	node mu 1.94 1.48	unknown 1.56 3.00	
NEW ≤ ∩	[%] pi rho a11p	pi 75.39 3.67 2.22	rec rho 11.97 72.37 14.87	onstruc a11p 0.50 8.81 67.08	ted tau a13p 3.18 4.72 4.10	decay n e 5.45 5.94 6.23	node mu 1.94 1.48 1.37	↓ unknown 1.56 3.00 4.13	
NEW ≤∩ tr	[%] pi rho a11p a13p	pi 75.39 3.67 2.22 2.71	rec rho 11.97 72.37 14.87 2.96	onstruc a11p 0.50 8.81 67.08 1.62	ted tau a13p 3.18 4.72 4.10 73.09	decay n e 5.45 5.94 6.23 0.22	node mu 1.94 1.48 1.37 0.11	unknown 1.56 3.00 4.13 19.29	
NEW MC truth	[%] pi rho a11p a13p e	pi 75.39 3.67 2.22 2.71 0.21	rec rho 11.97 72.37 14.87 2.96 1.42	onstruc a11p 0.50 8.81 67.08 1.62 0.30	ted tau a13p 3.18 4.72 4.10 73.09 1.15	decay n e 5.45 5.94 6.23 0.22 94.74	node mu 1.94 1.48 1.37 0.11 0.57	↓ unknown 1.56 3.00 4.13 19.29 1.61	
NEW MC truth	[%] pi rho a11p a13p e mu	pi 75.39 3.67 2.22 2.71 0.21 1.73	rec rho 11.97 72.37 14.87 2.96 1.42 0.87	onstruc a11p 0.50 8.81 67.08 1.62 0.30 0.07	ted tau a13p 3.18 4.72 4.10 73.09 1.15 1.69	decay n e 5.45 5.94 6.23 0.22 94.74 0.20	node mu 1.94 1.48 1.37 0.11 0.57 94.33	unknown 1.56 3.00 4.13 19.29 1.61 1.12	
NEW MC truth	[%] pi rho a11p a13p e mu other	pi 75.39 3.67 2.22 2.71 0.21 1.73 11.00	rec rho 11.97 72.37 14.87 2.96 1.42 0.87 21.20	onstruc a11p 0.50 8.81 67.08 0.30 0.30 0.07 18.29	ted tau a13p 3.18 4.72 4.10 73.09 1.15 1.69 28.27	decay n e 5.45 5.94 6.23 0.22 94.74 0.20 1.77	node mu 1.94 1.48 1.37 0.11 0.57 94.33 0.54	unknown 1.56 3.00 4.13 19.29 1.61 1.12 18.94	

IsolatedLeptonTagging+ ECAL information were applied to the case #charged particle inside cone = 2

Change some cut value determined by looking at distribution for each decay modes

overlay or mumu events?



















2 possible solutions 1 possible solution NO solutions "cone method" "Midpoint method"







# however, we have another problem sometimes mathematically calculated $\cos \beta > 1$ due to the uncertainty

Suehara-san's suggestions



cone with width depends on error



 $\sigma_{|P_{\rm vis}|}$ 

 $\sigma_{E_{
m vis}}$ 



by looking at chi2 distribution with constraint

> $m_{\tau} = 1.776 \,\,{\rm GeV}$  $\tau$ - $\tau$  is back-to-back

> > find smallest chi2

