

Analysis on Dielectron radiation

Comparison of STS versions v16g and v19a

INTRODUCTION:

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Data

Input Files: Au+Au, central collisions at 8 AGeV + pluto signal embedded in each event;

Number of Events: 10M (2M per pluto particle)

Geometry:

sis100_electron

Magnet: v18a

Pipe: v16b_1e

RICH: v17a_1e

TRD: v17n_1e

TOF: v16e_1e

MVD: v17a_tr

PSD: v18e (only v16g version, deactivated atv19a)

Weights:

omega -> epem: $2.5 * 7.28e-5$

omega -> dalitz: $2.5 * 7.7e-4$

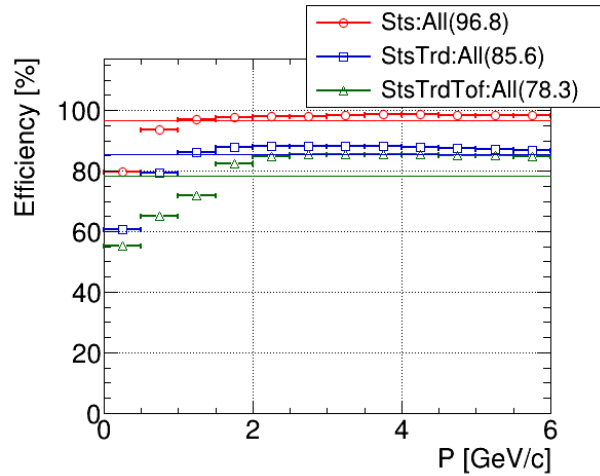
phi: $0.365 * 2.97e-4$

in-medium-rho: $0.5 * 4.45e-2$

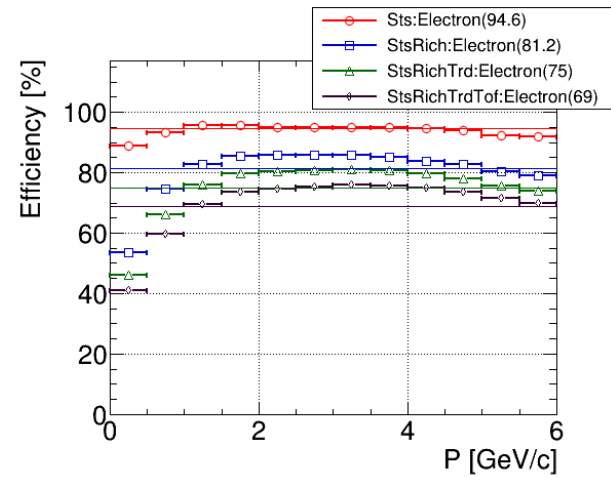
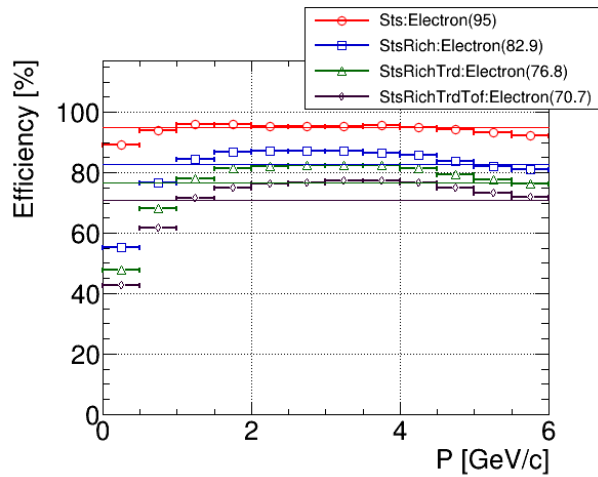
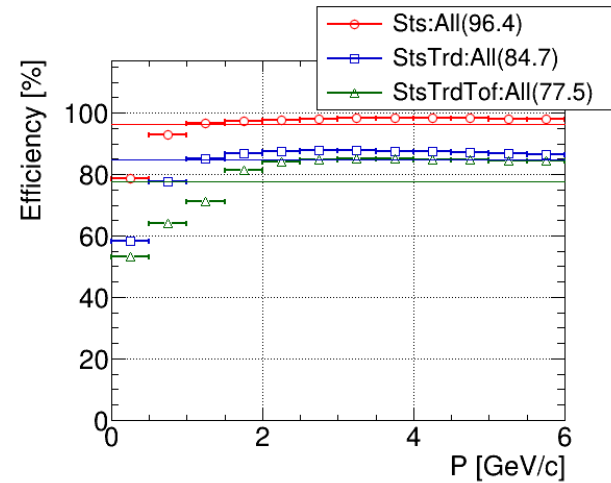
QGP: $0.5 * 1.15e-2$

STS v16g vs. v19a: Global Tracking Efficiency

STS: v16g

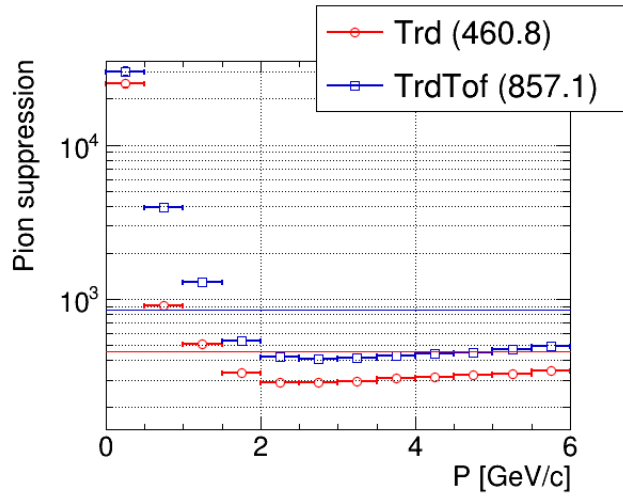


STS: v19a

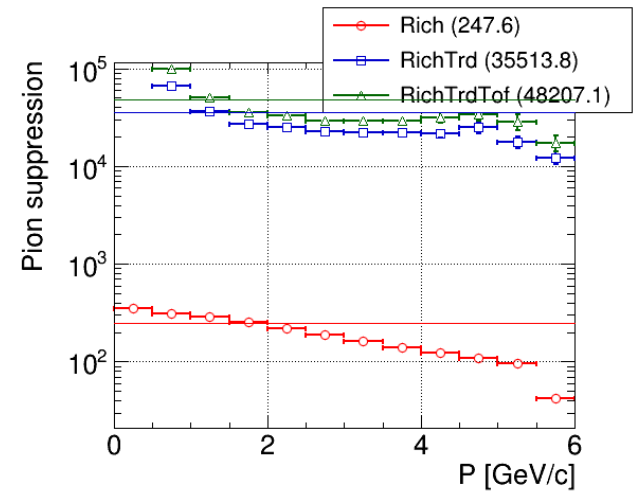
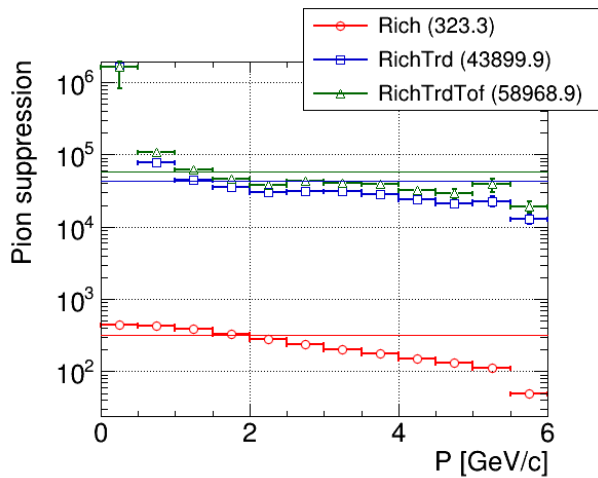
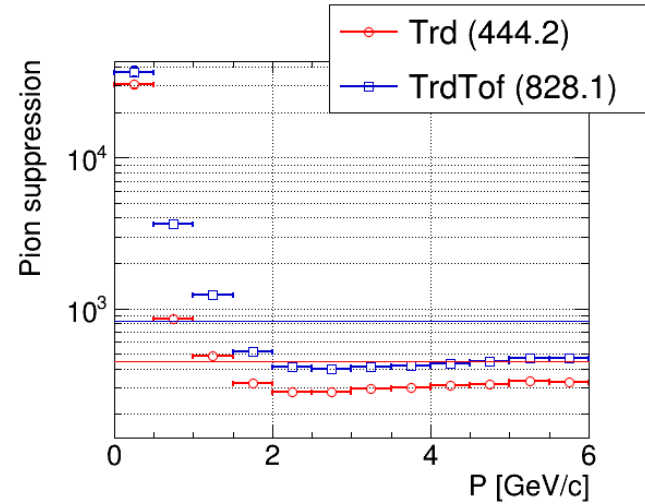


STS v16g vs. v19a: Pion Suppression

STS: v16g



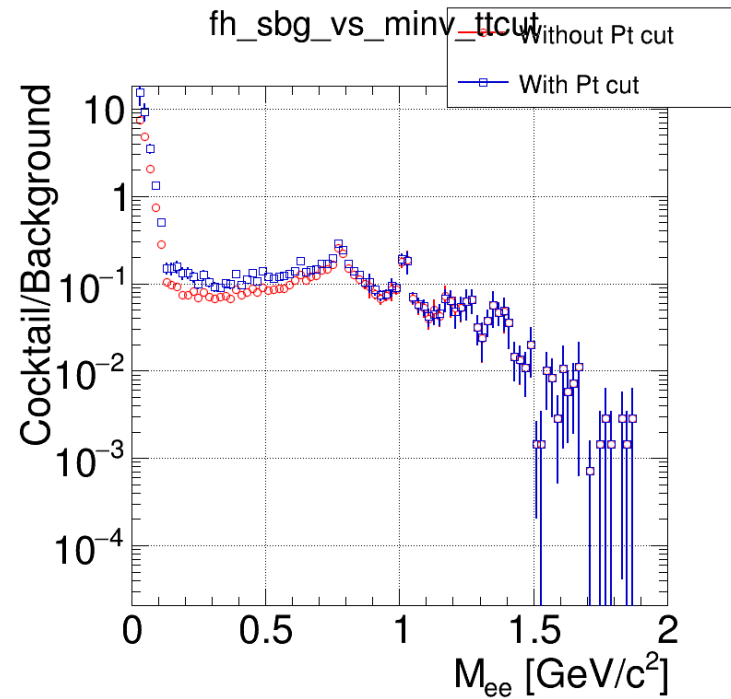
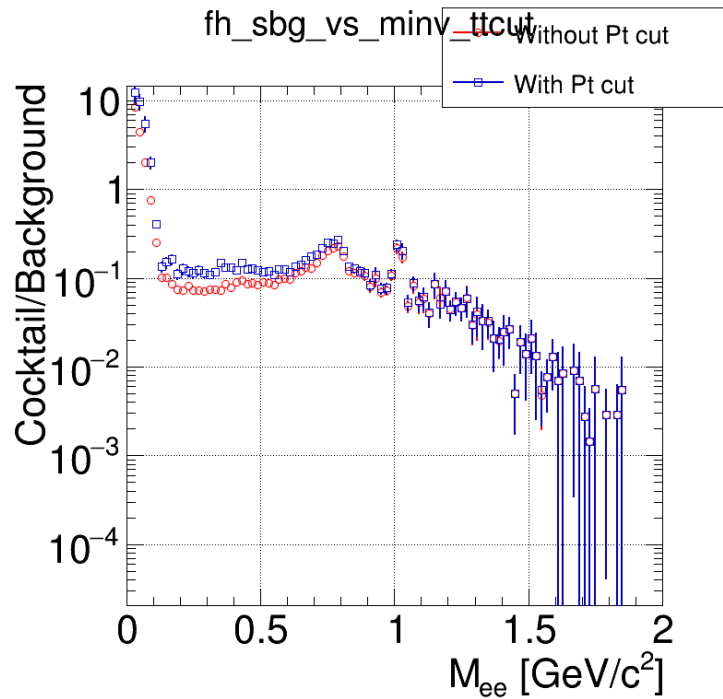
STS: v19a



STS v16g vs. v19a: Signal/BG Ratio

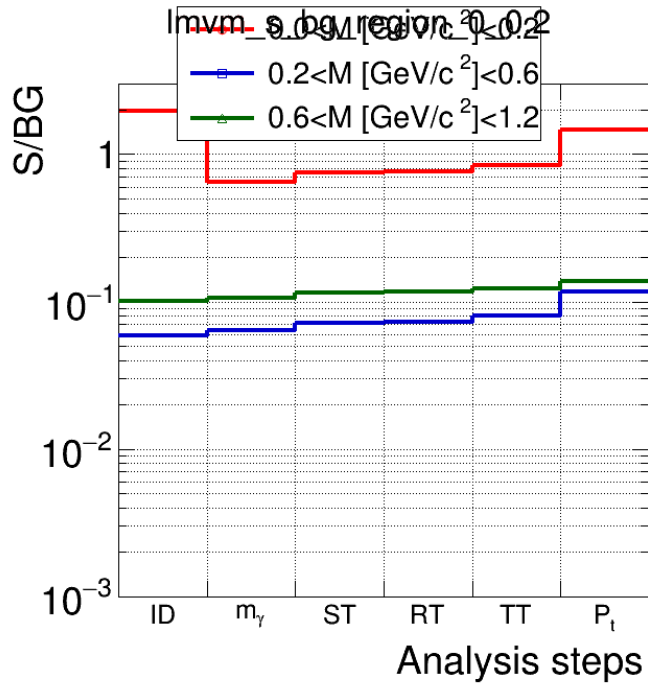
STS: v16g

STS: v19a

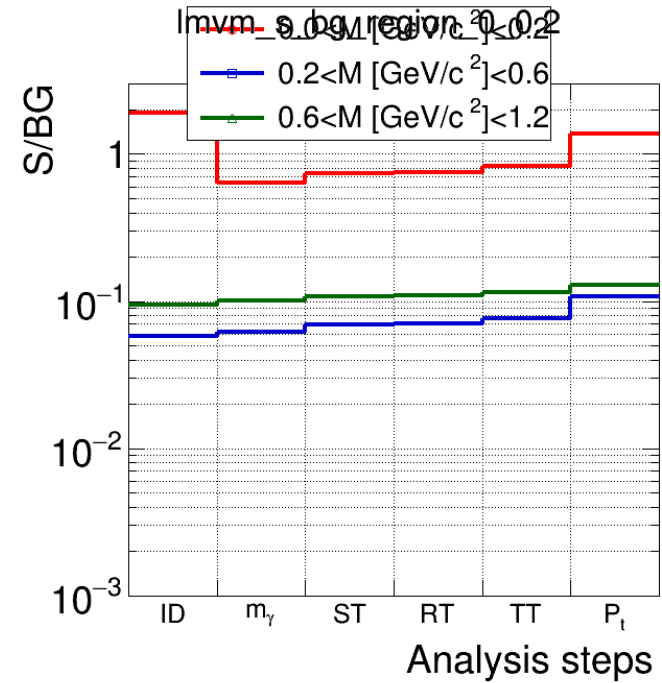


STS v16g vs. v19a: S/BG vs. Analysis Step

STS: v16g

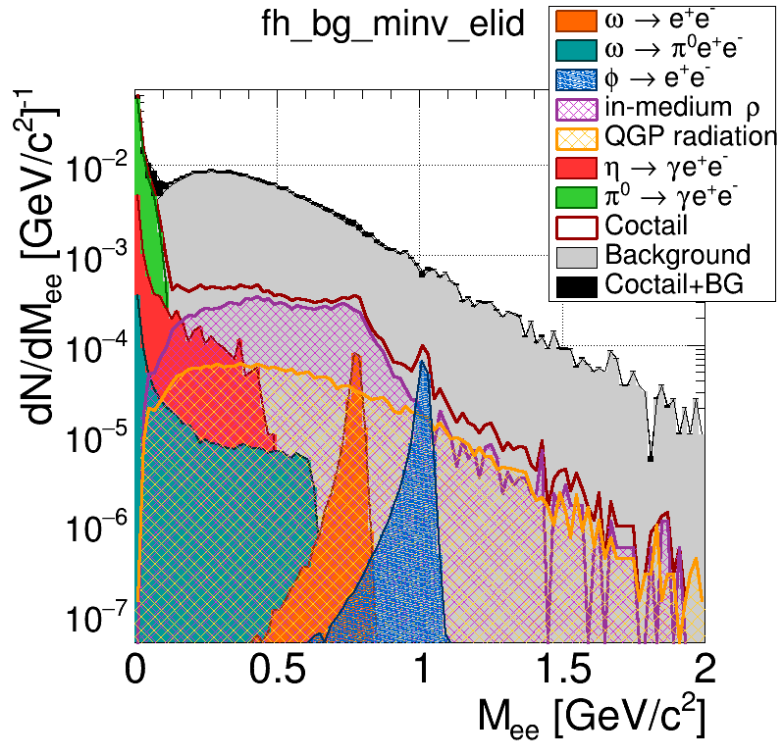


STS: v19a

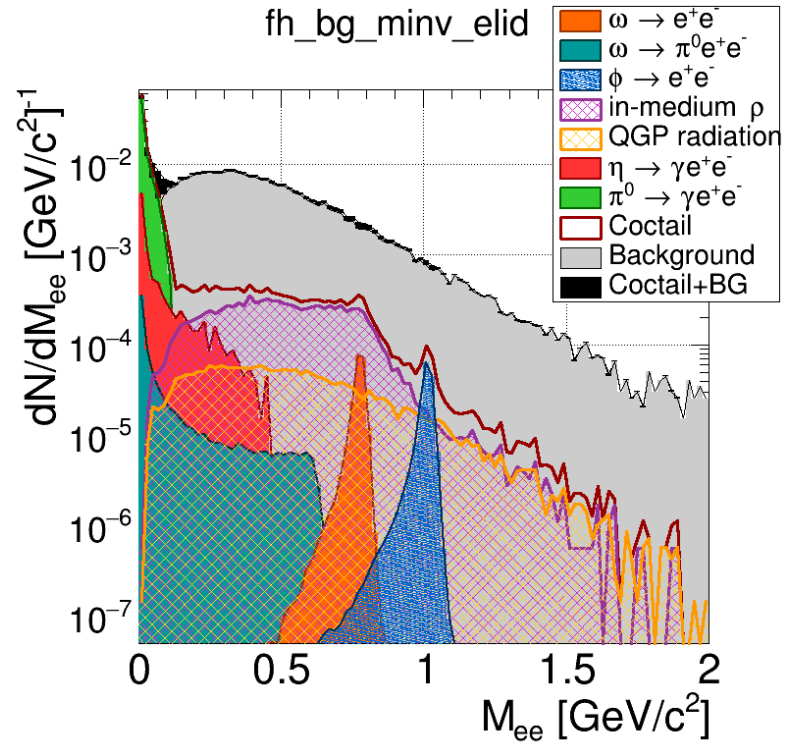


STS v16g vs. v19a: Invariant Mass

STS: v16g



STS: v19a



STS v16g vs. v19a: Dash Board

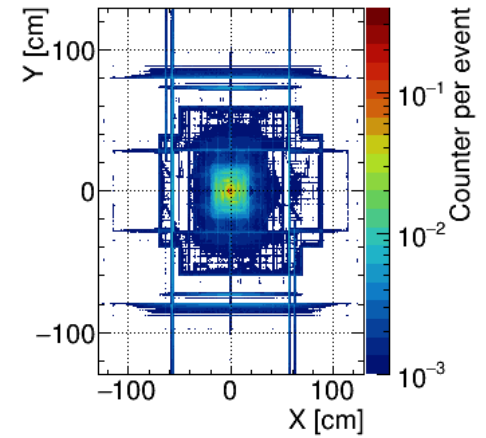
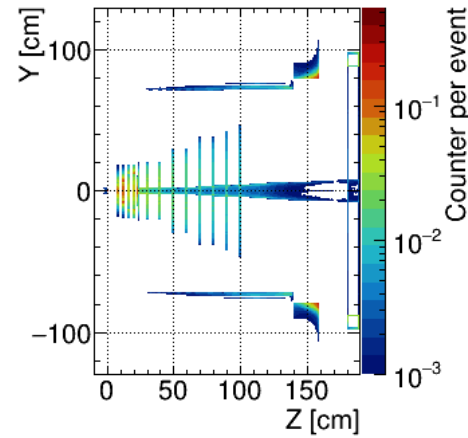
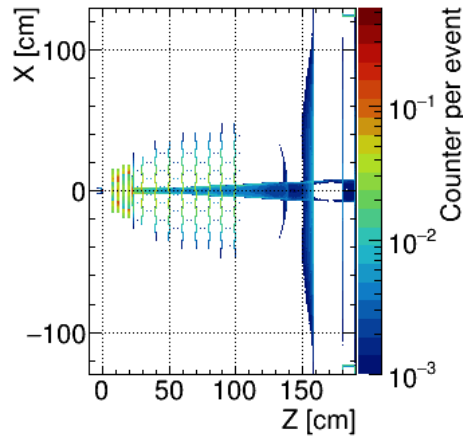
STS: v16g

STS: v19a

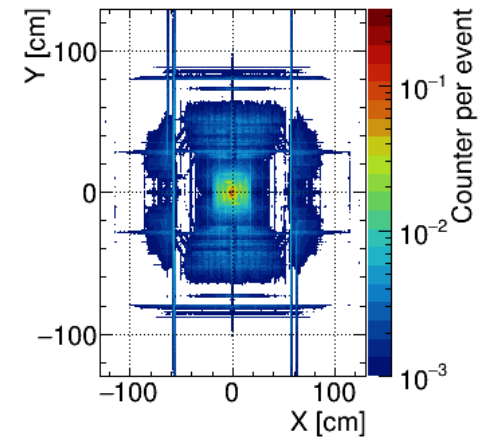
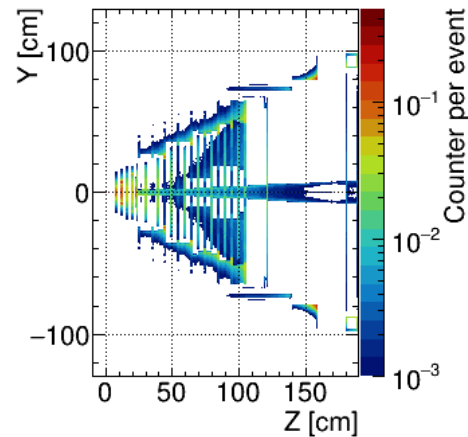
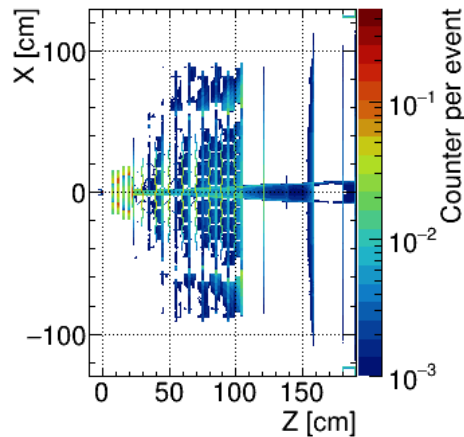
signal	step	eff, %	S/BG	mean	sigma	signal	step	eff, %	S/BG	mean	sigma
im_rho	elid	0.92	-	-	-	im_rho	elid	0.89	-	-	-
im_rho	gammacut	0.92	-	-	-	im_rho	gammacut	0.88	-	-	-
im_rho	stcut	0.91	-	-	-	im_rho	stcut	0.88	-	-	-
im_rho	rtcut	0.91	-	-	-	im_rho	rtcut	0.88	-	-	-
im_rho	ttcut	0.91	-	-	-	im_rho	ttcut	0.87	-	-	-
im_rho	ptcut	0.56	-	-	-	im_rho	ptcut	0.54	-	-	-
qgp	elid	0.77	-	-	-	qgp	elid	0.74	-	-	-
qgp	gammacut	0.77	-	-	-	qgp	gammacut	0.74	-	-	-
qgp	stcut	0.76	-	-	-	qgp	stcut	0.74	-	-	-
qgp	rtcut	0.76	-	-	-	qgp	rtcut	0.74	-	-	-
qgp	ttcut	0.76	-	-	-	qgp	ttcut	0.73	-	-	-
qgp	ptcut	0.49	-	-	-	qgp	ptcut	0.48	-	-	-
omega	elid	2.35	0.030	777.3	15.8	omega	elid	2.24	0.028	777.4	15.9
omega	gammacut	2.35	0.032	777.3	15.8	omega	gammacut	2.24	0.030	777.4	15.9
omega	stcut	2.33	0.035	777.3	15.8	omega	stcut	2.23	0.032	777.4	15.9
omega	rtcut	2.33	0.035	777.3	15.8	omega	rtcut	2.23	0.032	777.4	15.9
omega	ttcut	2.33	0.037	777.3	15.8	omega	ttcut	2.22	0.034	777.4	15.9
omega	ptcut	2.12	0.043	777.5	15.7	omega	ptcut	2.01	0.039	777.6	15.8
phi	elid	3.06	0.064	1014.1	16.6	phi	elid	2.92	0.053	1014.1	16.8
phi	gammacut	3.06	0.066	1014.1	16.6	phi	gammacut	2.92	0.055	1014.1	16.8
phi	stcut	3.05	0.069	1014.1	16.6	phi	stcut	2.91	0.059	1014.1	16.8
phi	rtcut	3.05	0.069	1014.1	16.6	phi	rtcut	2.91	0.060	1014.1	16.8
phi	ttcut	3.04	0.073	1014.1	16.6	phi	ttcut	2.91	0.061	1014.1	16.8
phi	ptcut	2.99	0.080	1014.2	16.6	phi	ptcut	2.86	0.065	1014.1	16.7

STS v16g vs. v19a: Origin of Vertex (in-medium-rho)

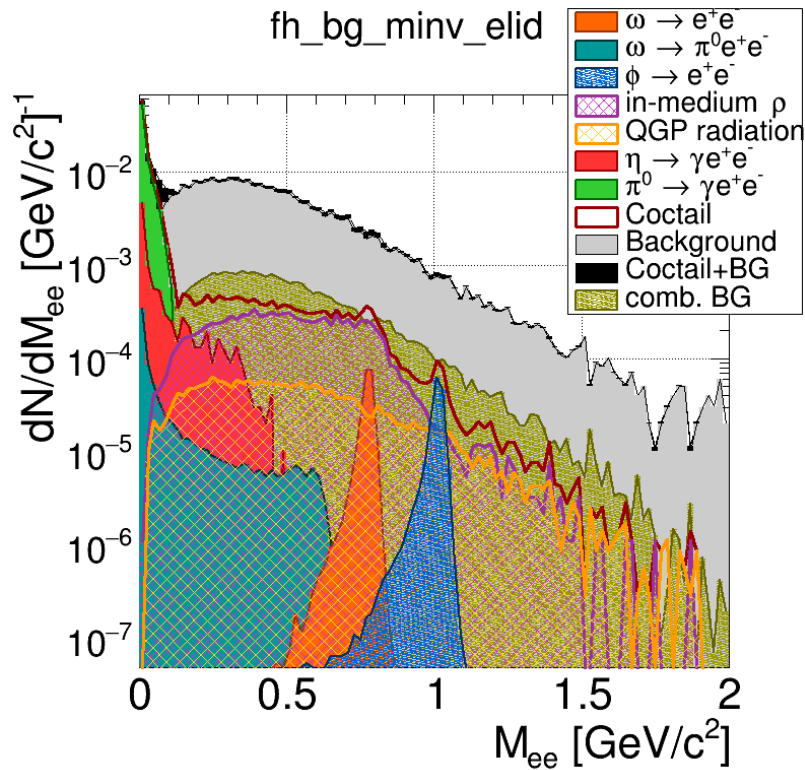
STS: v16g



STS: v19a



Combinatorial BG



$$B_{comb} = 2k \sqrt{\langle B_{++} \rangle \langle B_{--} \rangle} \quad 1)$$

$$k = \frac{\langle b_{+-} \rangle}{2\sqrt{\langle b_{++} \rangle \langle b_{--} \rangle}}$$

Contributions of same and mixed event pairing are included.

capital B : contributions from same event
 not-capital b : contributions from event mixing

Combinatorial BG differs from real BG yet
 -> have to look up where error originates from

¹⁾ Many thanks to Jan-Hendrik Otto

Thank you for your attention!