F_π with σ_3

March 2, 2022

By measuring the pion mass with σ_1, we had obtained the results of F_π shown in Table 1. Using σ_3 the results are slightly different and we show them in Table 2

β	F_π variance	F_π chi-squared
2	0.392(2)	0.393(3)
3	0.3923(8)	0.3925(11)
4	0.3937(9)	0.393(1)
5	0.3956(10)	0.3962(13)

Table 1: F_π obtained through a fit of the form $m_\pi^R = \frac{1}{2F_\pi^2 L}$. The pion mass was measured with σ_1

β	F_π variance	F_π chi-squared
2	0.3866(9)	0.3867(9)
3	0.3887(5)	0.3887(7)
4	0.3871(9)	0.3877(11)
5	0.3919(6)	0.3923(6)

Table 2: F_π obtained through a fit of the form $m_\pi^R = \frac{1}{2F_\pi^2 L}$. The pion mass was measured with σ_3

From figure 1 to 5 we show the pion mass, measured with σ_3, as a function of $(m_{\text{pcac}}^2 g)^{1/3}$ for $\beta = 2, 3, 4$ and 5 and several lattices. We fitted a function of the form $\sqrt{a + b\,x^3}$ to the data.

In figure 6 we show the behavior of the residual pion mass as a function of $1/L$ for $\beta = 2, 3, 4$ and 5, together with a fit of the form a/L.
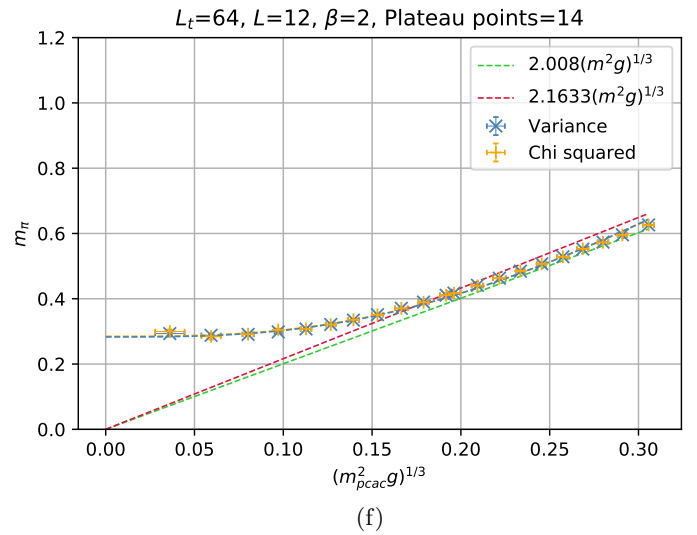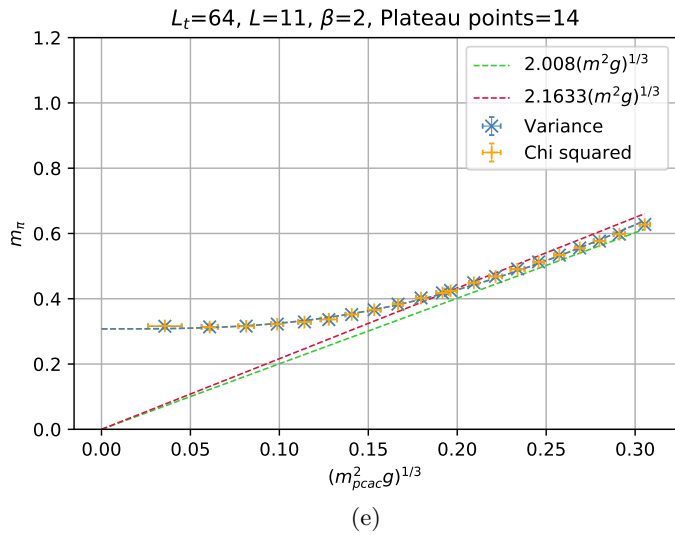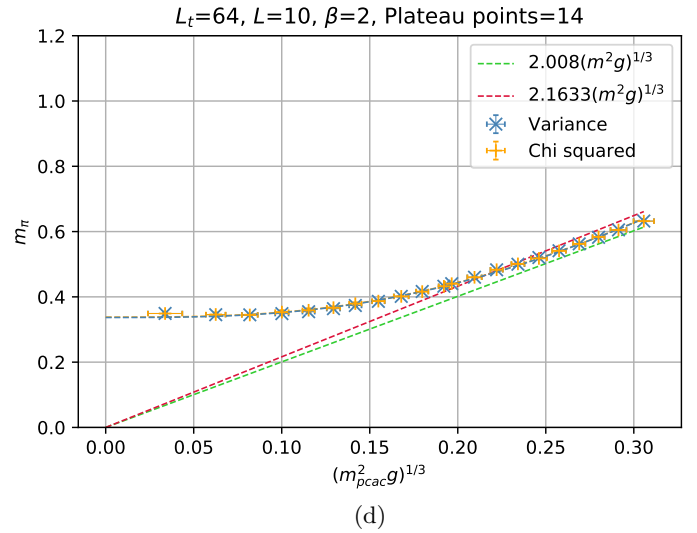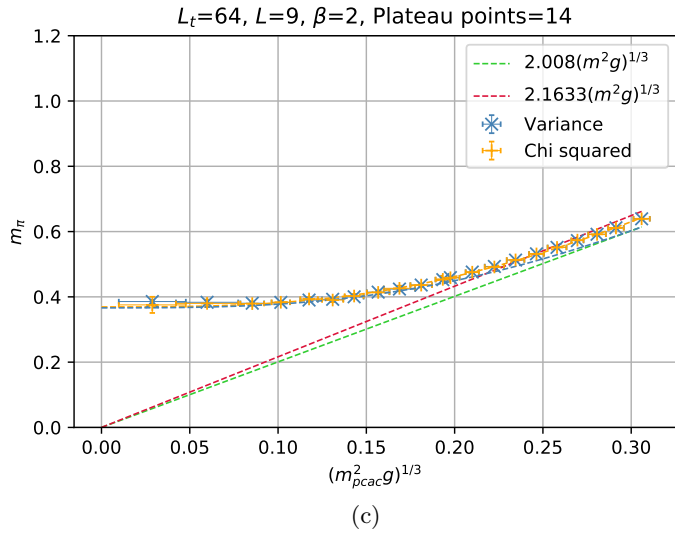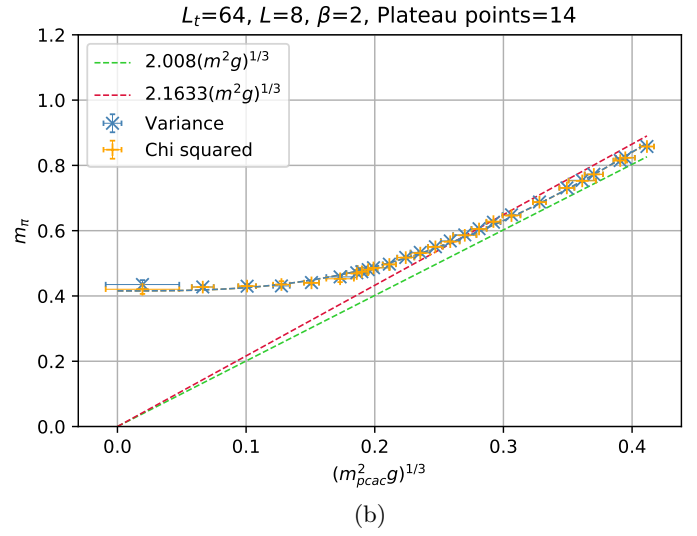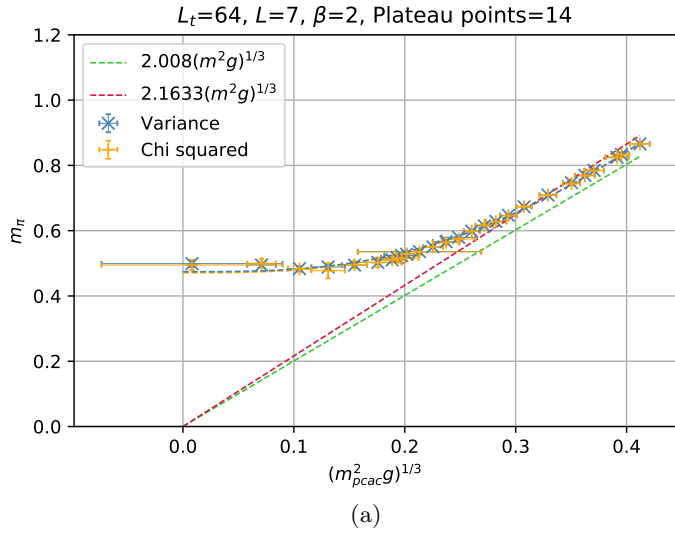
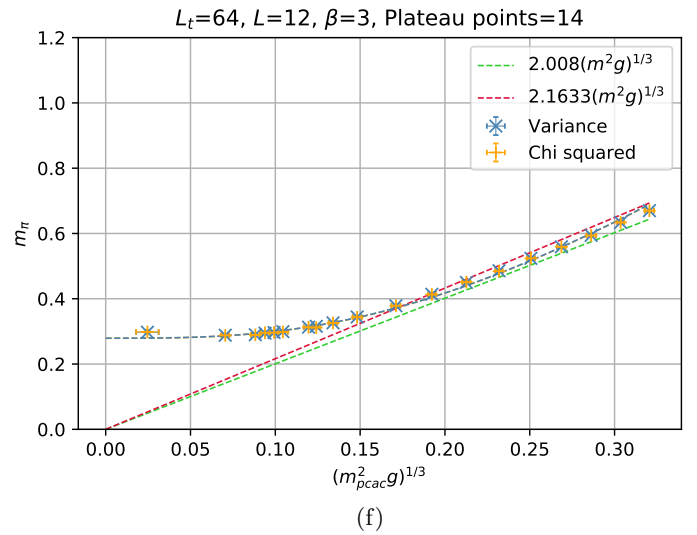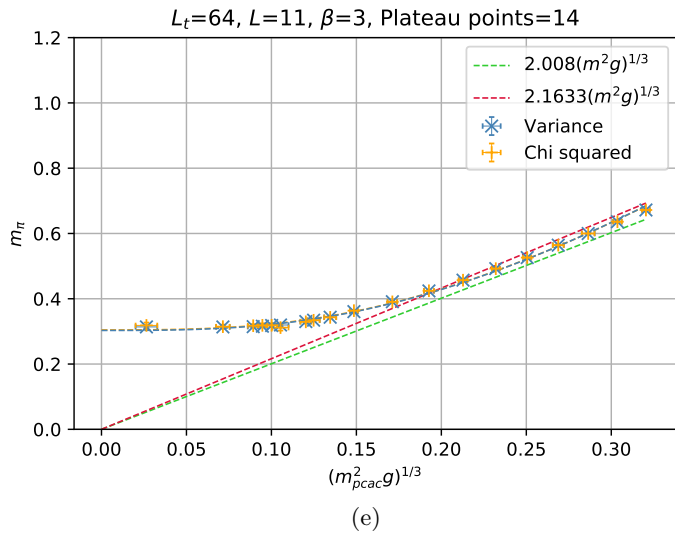Figure 1: m_π vs. $(m_{\text{pcac}}^2 g)^{1/3}$ for $\beta = 2$. The pion mass was measured using σ_3.
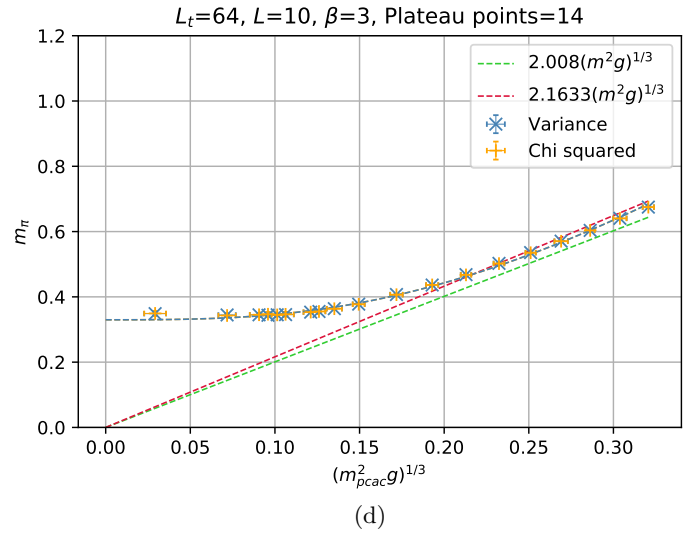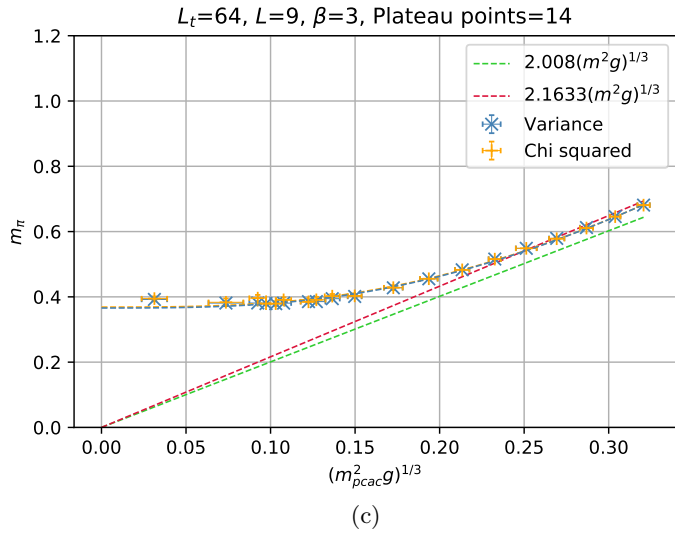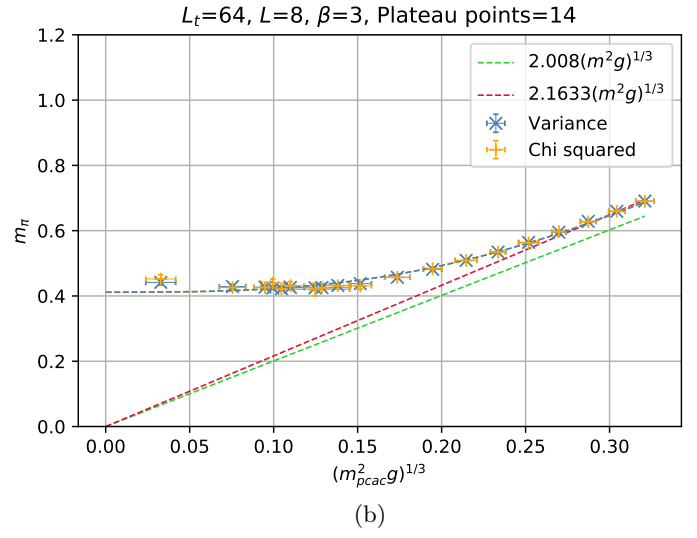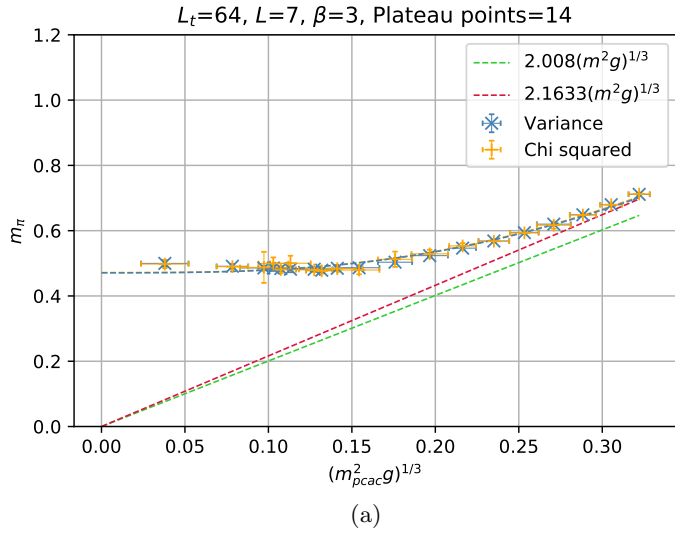
Figure 2: m_π vs. $(m_{\text{pcac}}^2 g)^{1/3}$ for $\beta = 3$. The pion mass was measured using σ_3.
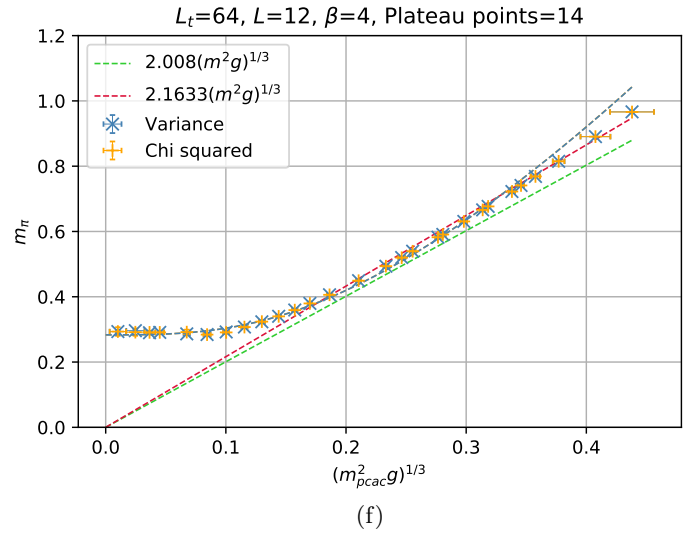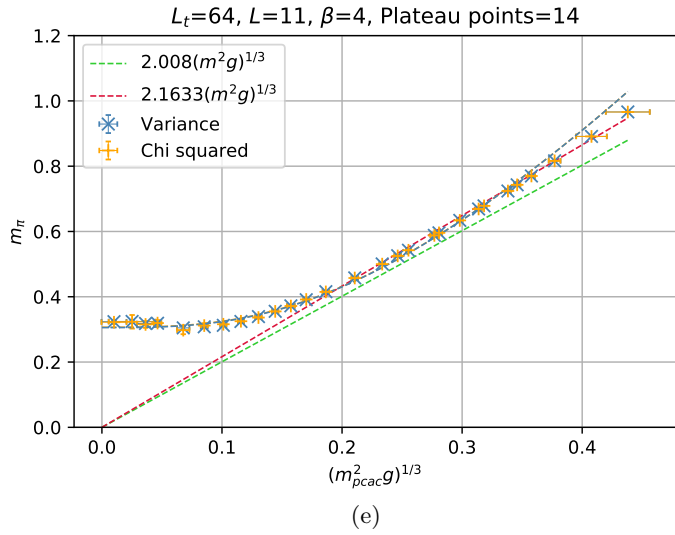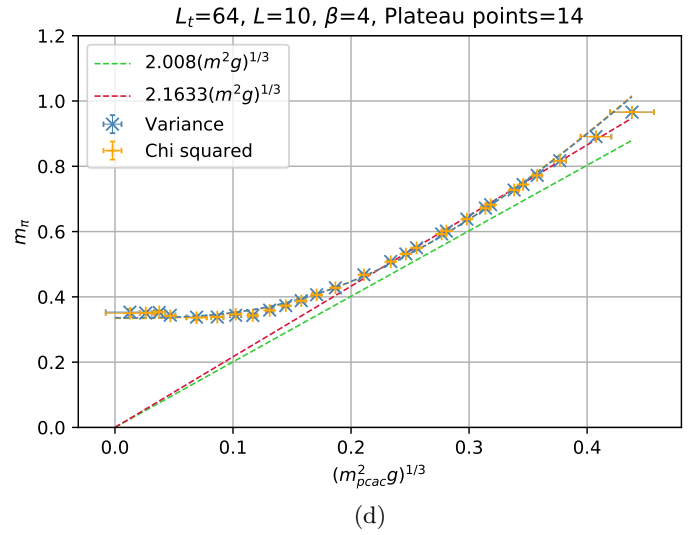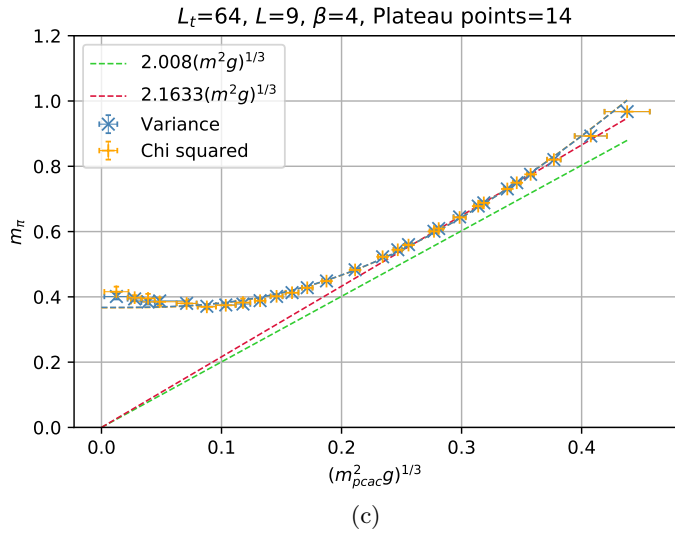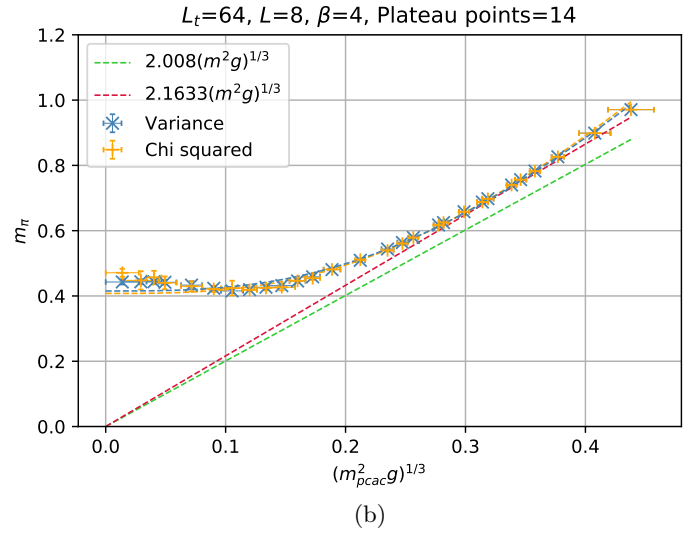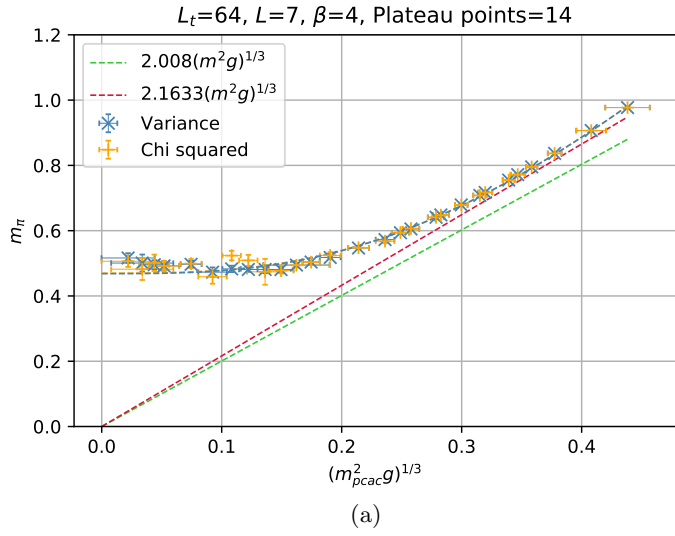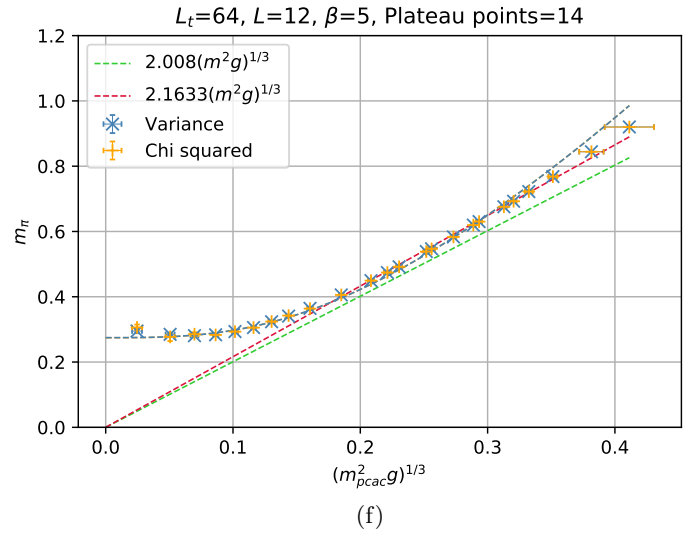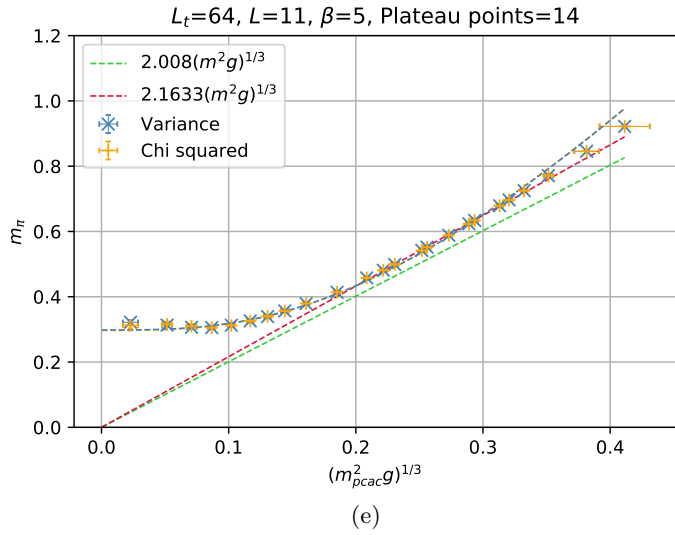
Figure 3: m_π vs. $(m^2_{\mathrm{pcac}} g)^{1/3}$ for $\beta = 4$. The pion mass was measured using σ_3.

Figure 4: m_π vs. $(m_{\text{pcac}}^2 g)^{1/3}$ for $\beta = 5$. The pion mass was measured using σ_3.
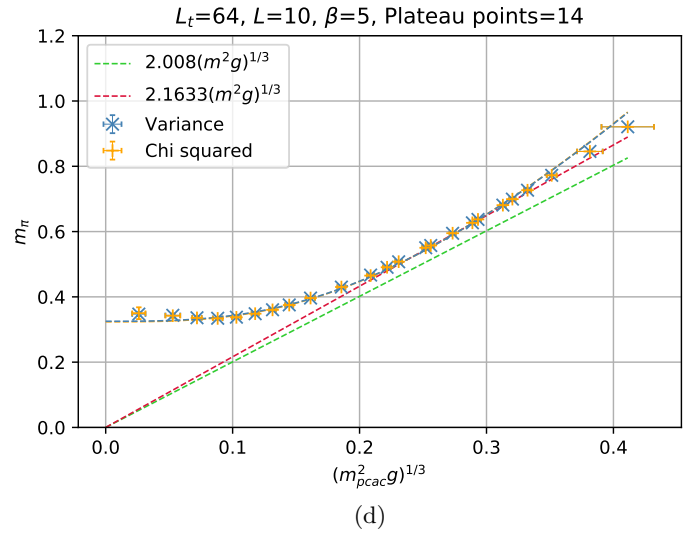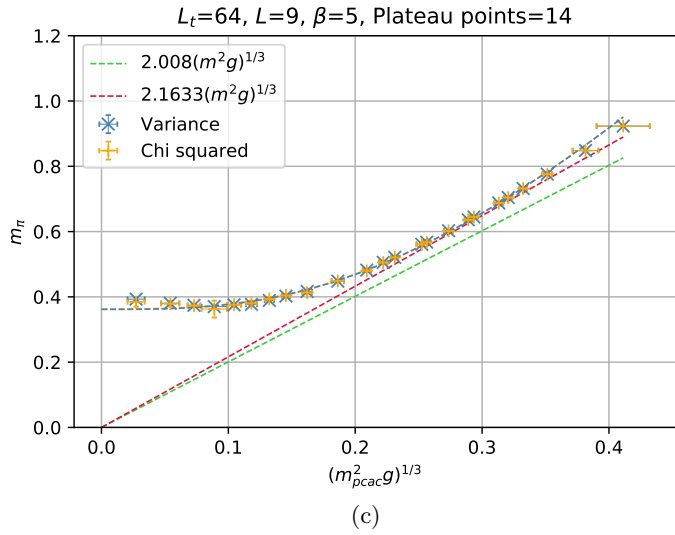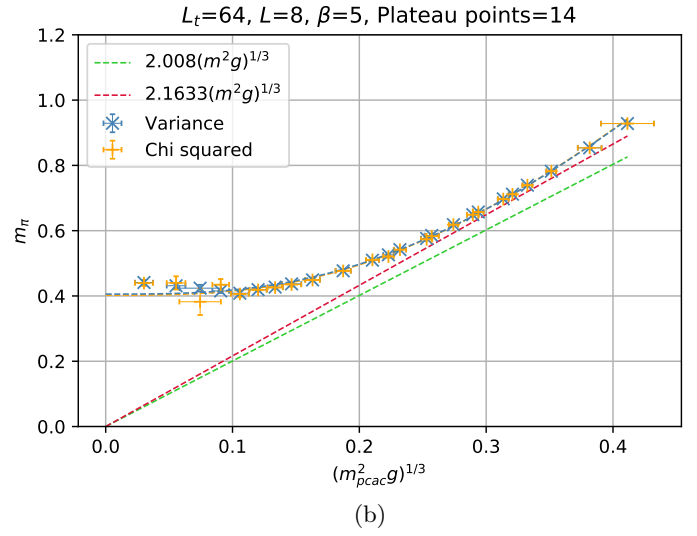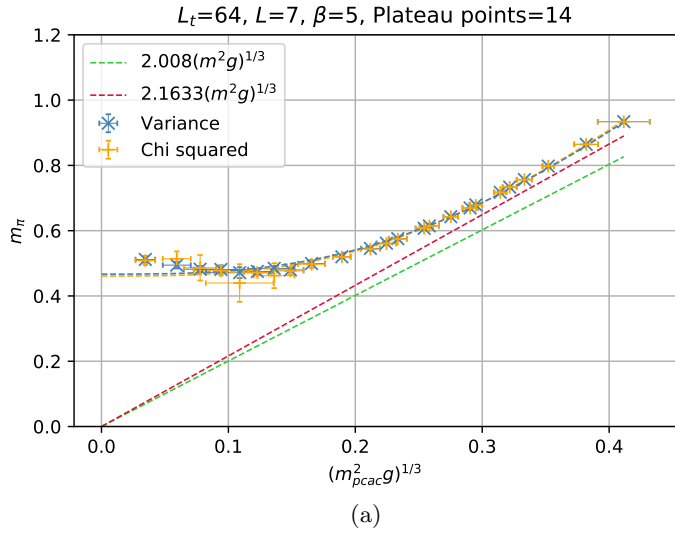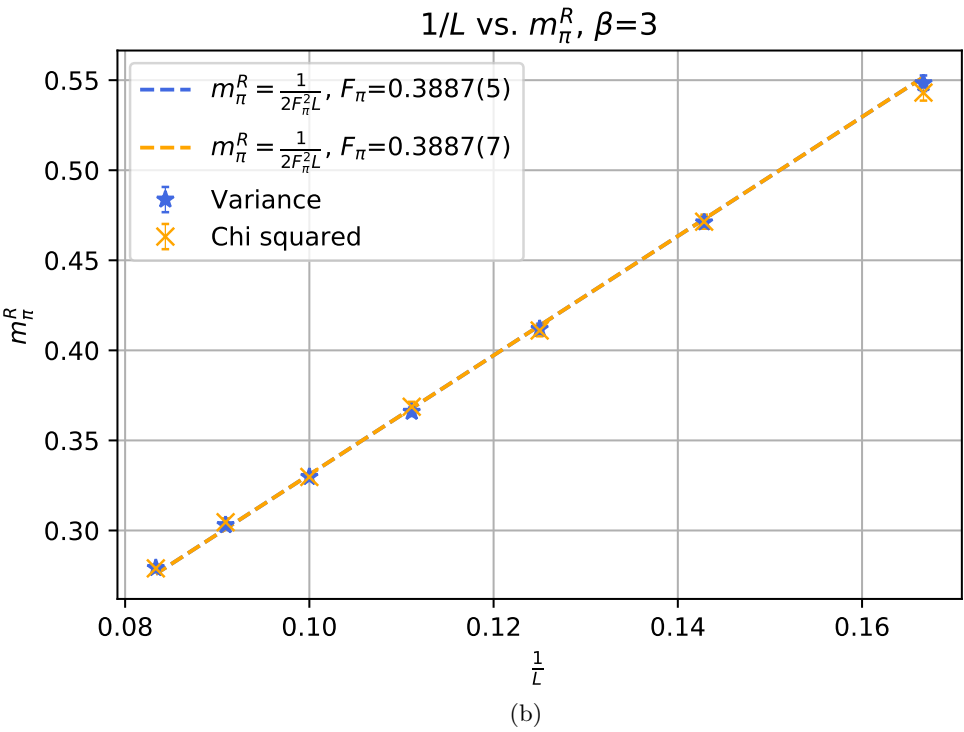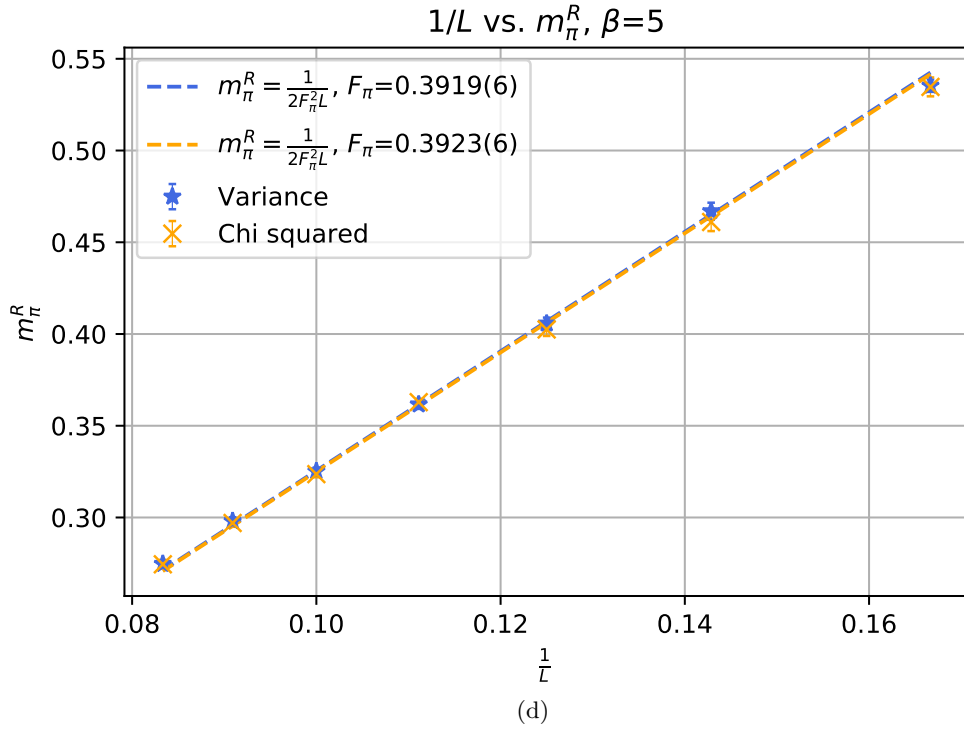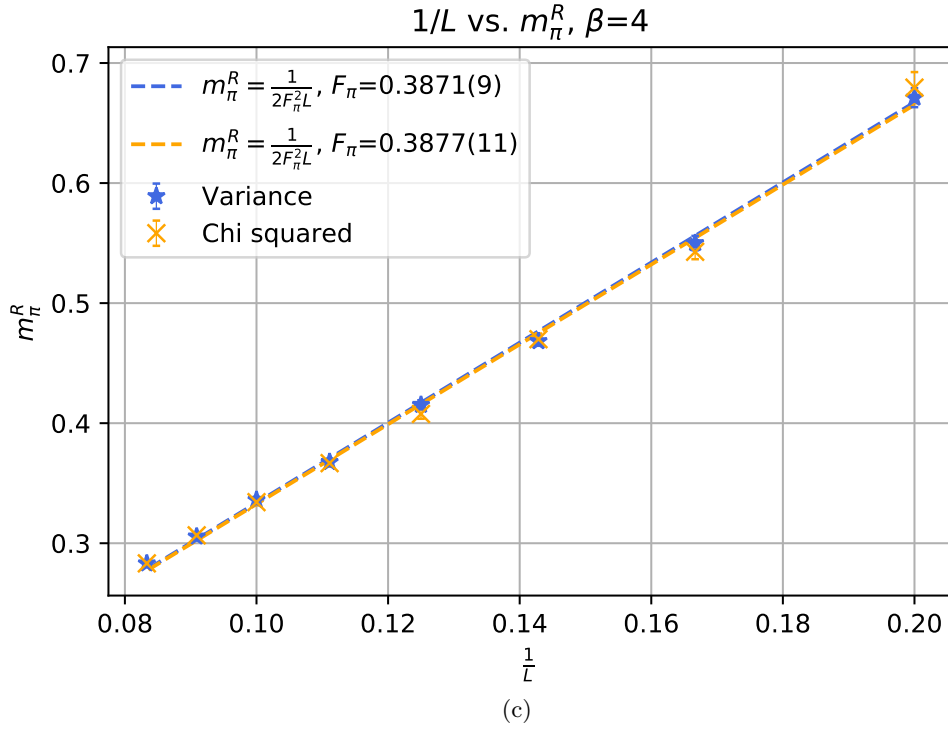
Pion decay constant

(a)

(b)
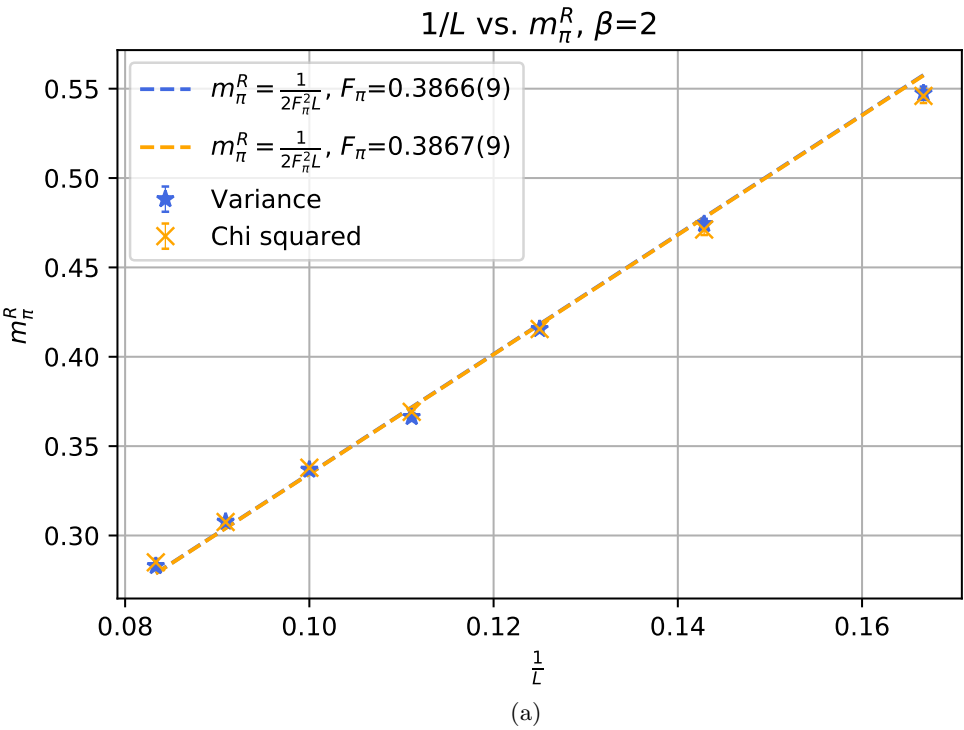
Figure 5: m_π^R vs. $1/L$. We fitted a function of the form $m_\pi^R = \frac{1}{2F_\pi^2 L}$