data = Import["C: 1090.dat"];

RC = Table[{data[[i, 1]], data[[i, 3]]}, {i, 1, 24}];

Rgas = Table[{data[[i, 1]], data[[i, 4]]}, {i, 1, 24}];

Erro = Table[data[[i, 5]], {i, 1, 24}];

TableForm[data, TableHeadings → {{"NGC 1090"}, {"Raio", "", "Vtotal", "Vgas", "Erro"}}];

Vgas = Interpolation[Rgas]

$$Vd[r\_, M\_] := \frac{\left(G(M10^9)\left(\frac{r}{Rd}\right)^2\right)\left(\text{BesselI}\left[0, \frac{r}{2Rd}\right]\text{BesselK}\left[0, \frac{r}{2Rd}\right] - \text{BesselI}\left[1, \frac{r}{2Rd}\right]\text{BesselK}\left[1, \frac{r}{2Rd}\right]\right)}{2Rd};$$

$$Vme[r\_, R\_, P\_] := \frac{6.4G\left((P10^7)R^3\right)\left(\frac{1}{2}\text{Log}\left[\left(\frac{r}{R}\right)^2 + 1\right] + \text{Log}\left[\frac{r}{R} + 1\right] - \text{ArcTan}\left[\frac{r}{R}\right]\right)}{r};$$

$$G := \frac{4.302}{10^6};$$

Rd:=3.4;

$$Vt[r\_, M\_, R\_, P\_] := \sqrt{Vd[r, M] + Vme[r, R, P] + Vgas[r]^2}$$

Ajuste = NonlinearModelFit[RC, Vt[r, M, R, P], {{R, 1, 50}, {P, 1, 10}, {M, 1, 50}}, r, Weights → 1/Erro^2]

Ajuste["ParameterTable"]

Needs["ErrorBarPlots"]

Gas = Plot[Igas[], {, "0.27931", 29.2}, PlotStyle → {Black, Dashed}, AxesLabel → {"R(Kpc)", "V(Km/s)"}];

Vstars = Plot[Sqrt[Vd[r, M]]/.M → 36.5, {r, 0, 29.4}, PlotStyle → {Black, Dotted}];

Vhalo = Plot[Sqrt[Vme[r, R, P]]/.{R → 7.8, P → 2.3}, {r, 0, 29.4}, PlotStyle → {Black, DotDashed}];

VRC = ErrorListPlot[{Table[{RC[[i]], ErrorBar[Erro[[i]]]}, {i, 24}]}, PlotStyle → Black, MeshStyle → PointSize

RCtotal = Plot[Vt[r, M, R, P]/.{M → 36.5, R → 7.8, P → 2.3}, {r, 0, 29.4}, PlotStyle → Black, PlotRange → {

Show[RCtotal, VRC, Vstars, Vhalo, Gas, Frame → True, PlotRange → {{0, 30}, {0, 190}}, PlotLabel → "NGC 1

FrameLabel → {"R(Kpc)", "V(Km/s)"}];

ErrorListPlot[{Table[{Table[{data[[i, 1]], Ajuste["FitResiduals"][[i]]}, {i, 26}][[i]], ErrorBar[Erro[[i]]]}, {i, 24}]},

PlotStyle → Black, MeshStyle → PointSize[Large], PlotRange → {−40, 20}, Frame → True, AspectRatio → 0.2]