1 E. coli Glucose data with alpha = 0

E. coli model (aerobic growth on glucose), balanced kinetic data

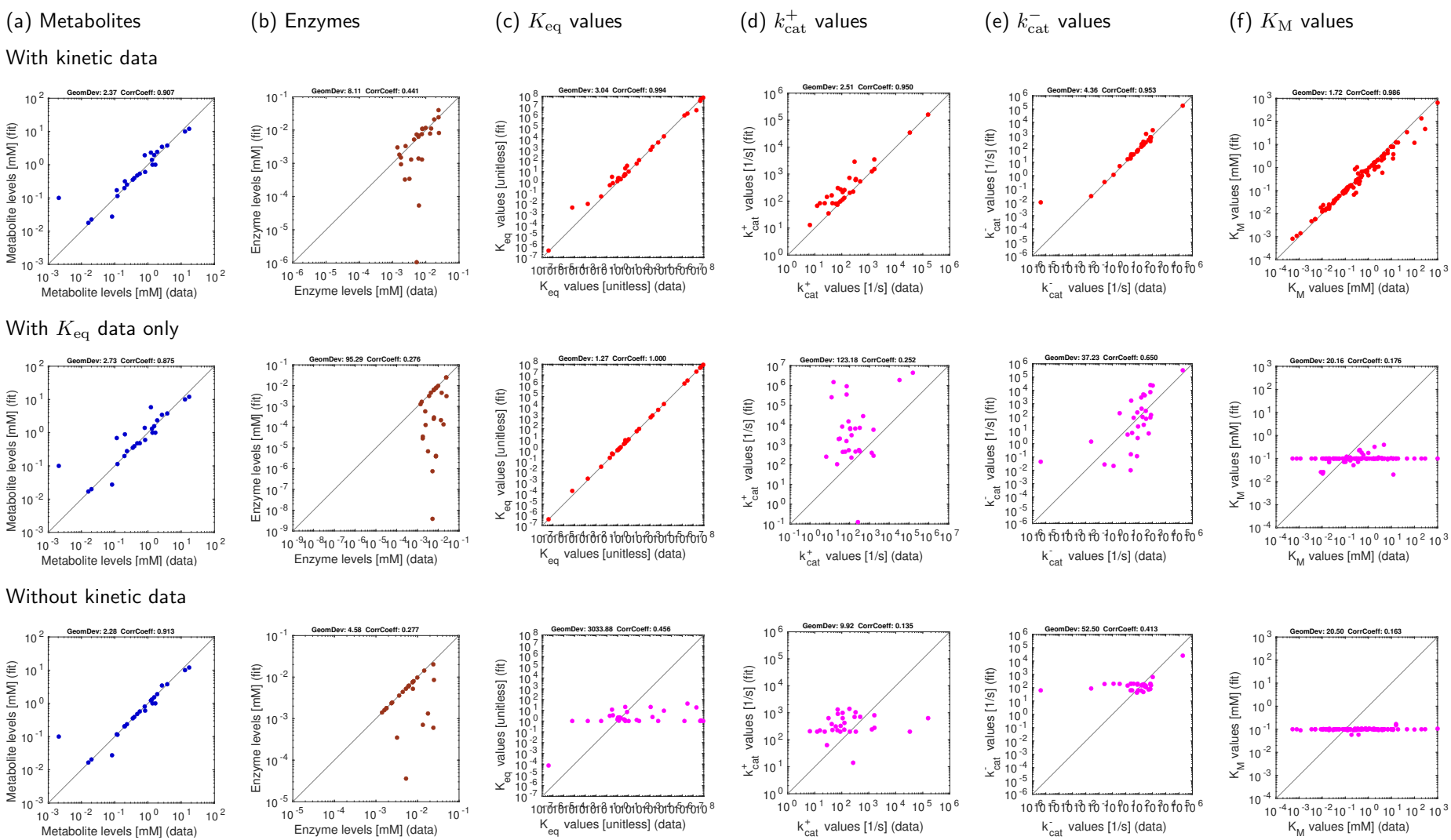
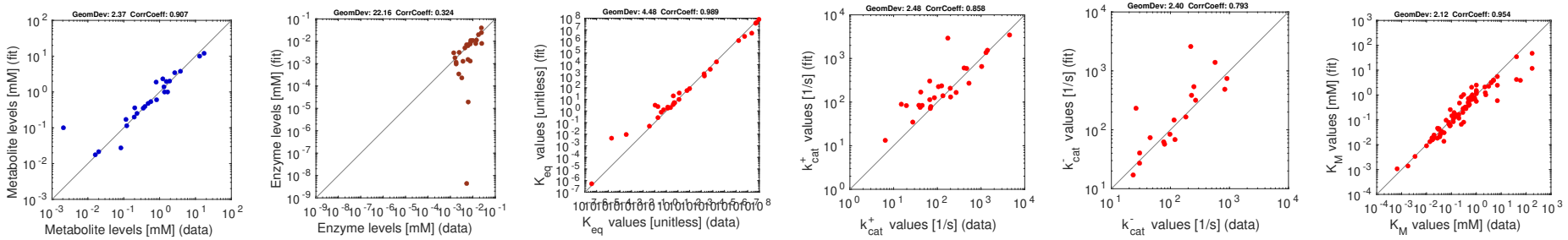


Figure 3: Results for *E. coli* central metabolism with experimental data (aerobic growth on glucose). The kinetic data stem from previous parameter balancing based on *in-vitro* data. Top: estimation using kinetic data. Centre: estimation using equilibrium constants as the only kinetic data. Centre: estimation using equilibrium constants as the only kinetic data. Bottom: estimation without usage of kinetic data. The same metabolite, enzyme, and kinetic data were used in [**?**].

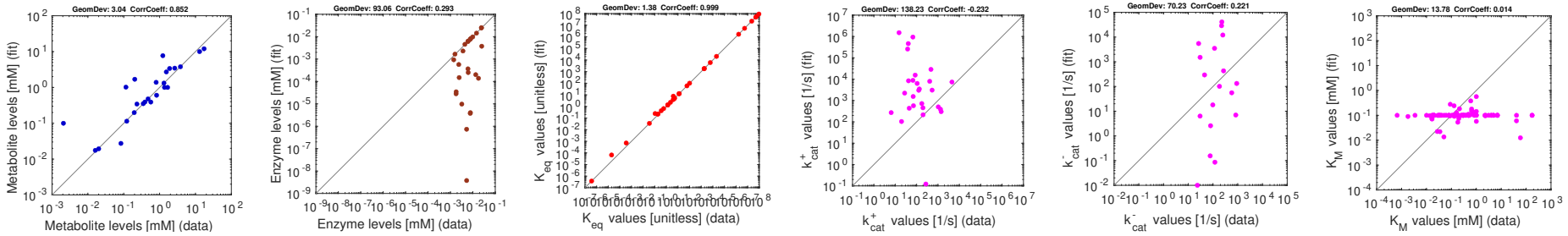
E. coli central metabolism model (aerobic growth on glucose), in-vitro kinetic data

(a) Metabolites (b) Enzymes (c) K_{eq} values (d) k_{cat}^{+} values (e) k_{cat}^{-} values (f) K_{M} values

With kinetic data



With K_{eq} data only



Without kinetic data

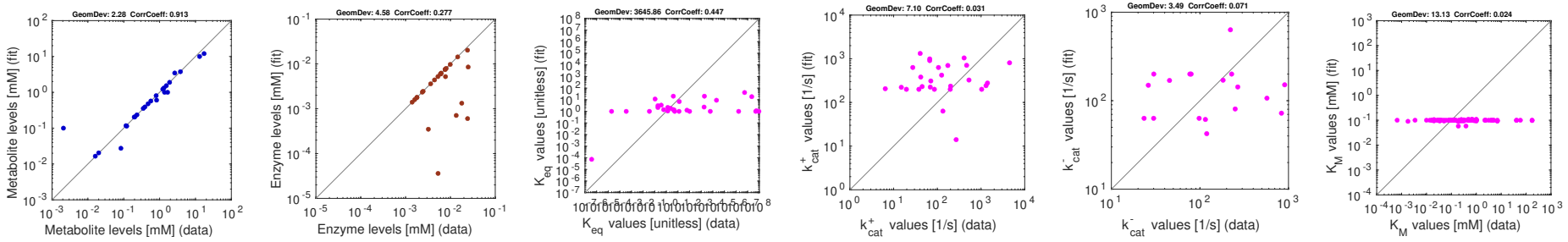


Figure 4: Results for *E. coli* central metabolism with experimental data (aerobic growth on glucose). Same as Figure 18, but based on original kinetic *in-vitro* data instead of balanced kinetic data.

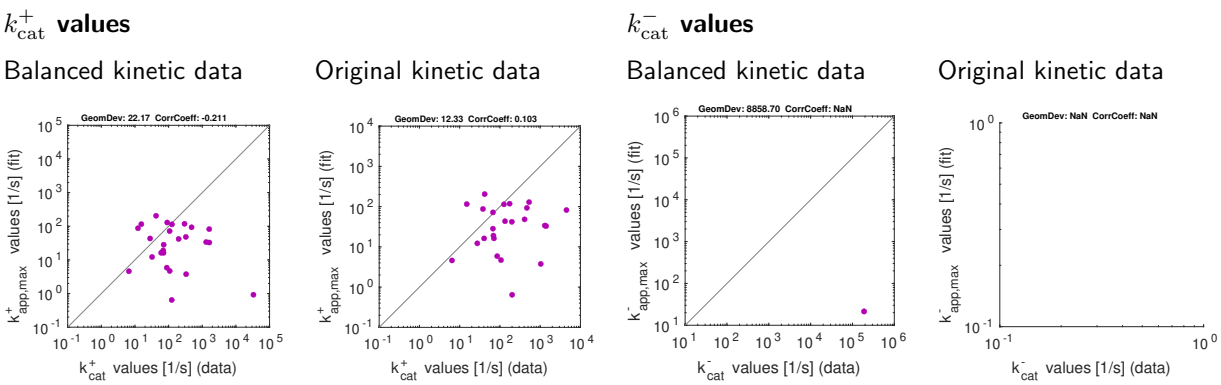


Figure 5: Catalytic constants in *E. coli* central metabolism model (aerobic growth on glucose), estimated by kinetic profiling [**?**].

2 E. coli Glucose data with alpha = 0.001

E. coli model (aerobic growth on glucose), balanced kinetic data

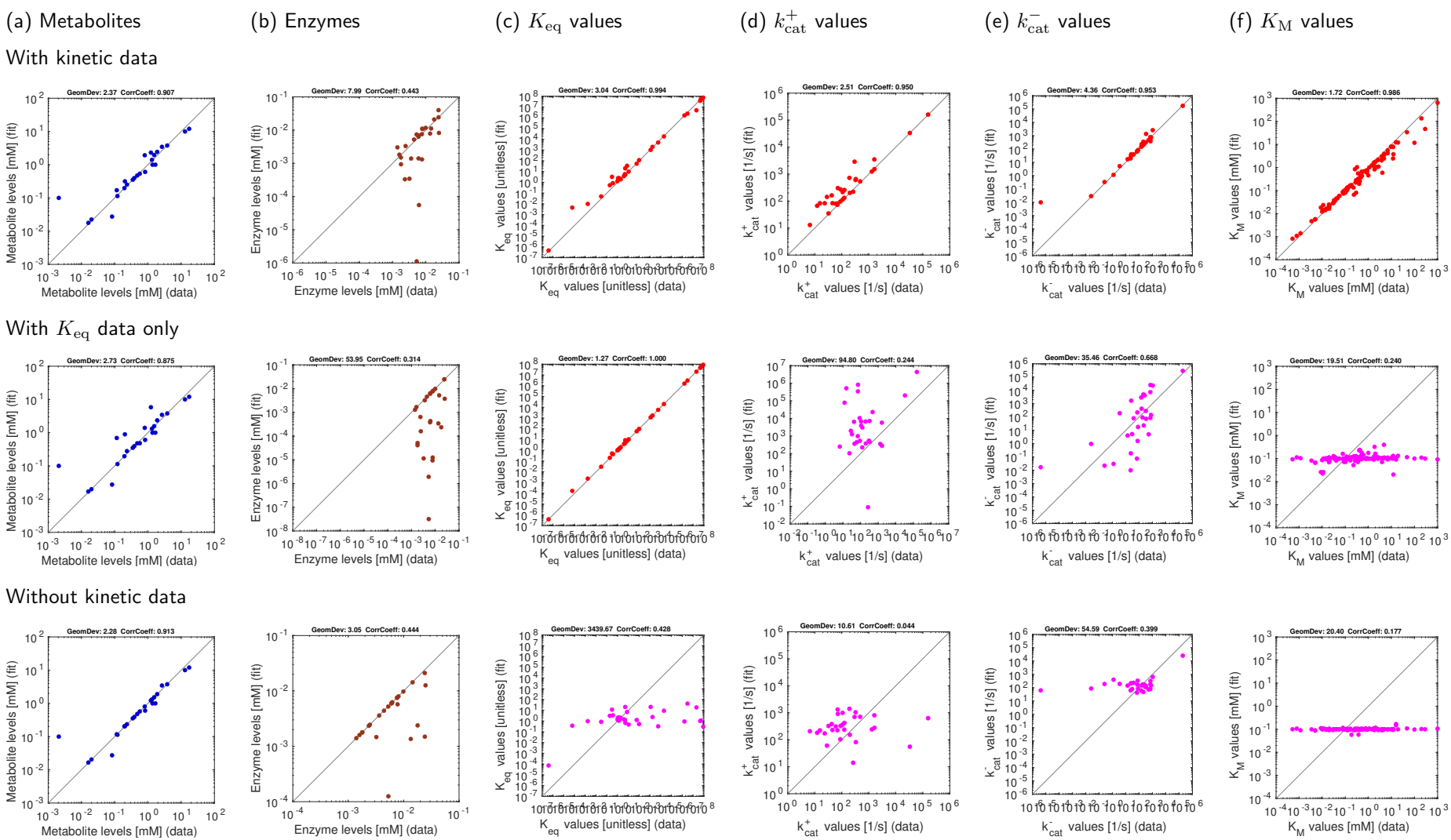
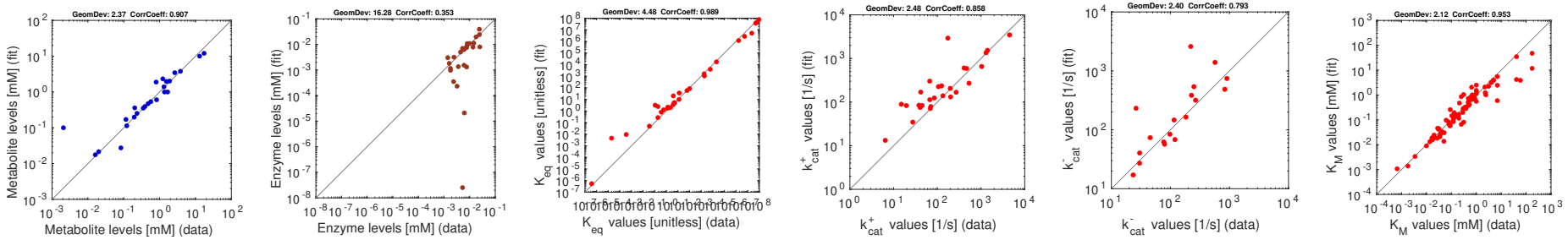


Figure 6: Results for *E. coli* central metabolism with experimental data (aerobic growth on glucose). The kinetic data stem from previous parameter balancing based on *in-vitro* data. Top: estimation using kinetic data. Centre: estimation using equilibrium constants as the only kinetic data. Centre: estimation using equilibrium constants as the only kinetic data. Bottom: estimation without usage of kinetic data. The same metabolite, enzyme, and kinetic data were used in [**?**].

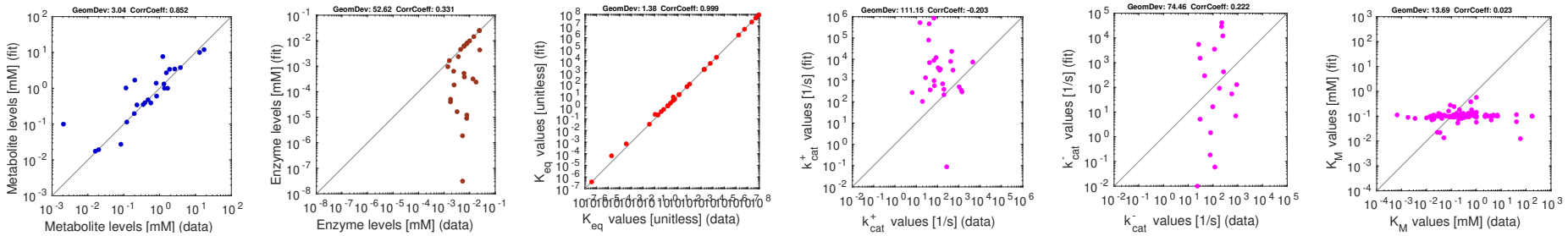
E. coli central metabolism model (aerobic growth on glucose), in-vitro kinetic data

(a) Metabolites (b) Enzymes (c) K_{eq} values (d) k_{cat}^{+} values (e) k_{cat}^{-} values (f) K_{M} values

With kinetic data



With K_{eq} data only



Without kinetic data

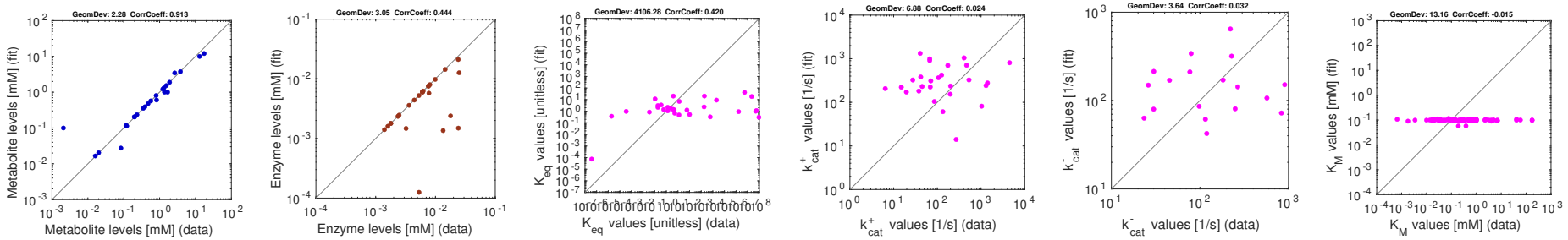


Figure 7: Results for *E. coli* central metabolism with experimental data (aerobic growth on glucose). Same as Figure 18, but based on original kinetic *in-vitro* data instead of balanced kinetic data.

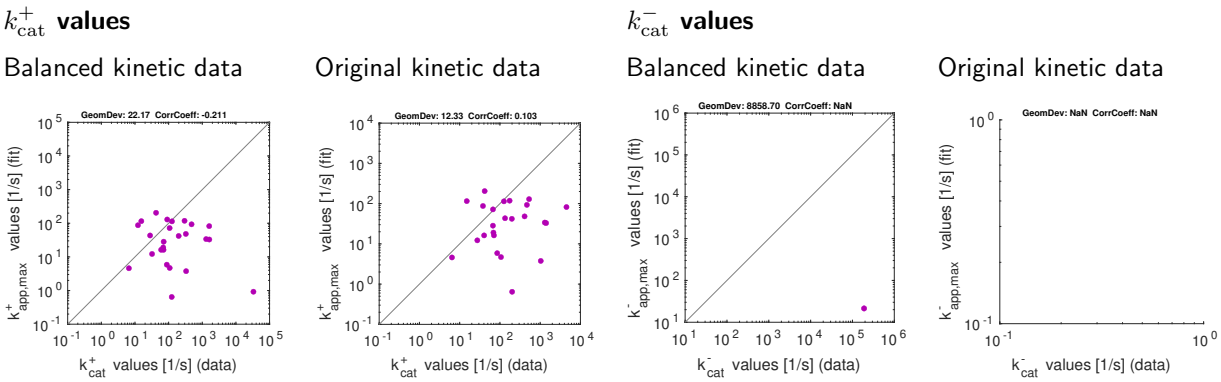


Figure 8: Catalytic constants in *E. coli* central metabolism model (aerobic growth on glucose), estimated by kinetic profiling [**?**].

3 E. coli Glucose data with alpha = 0.01

E. coli model (aerobic growth on glucose), balanced kinetic data

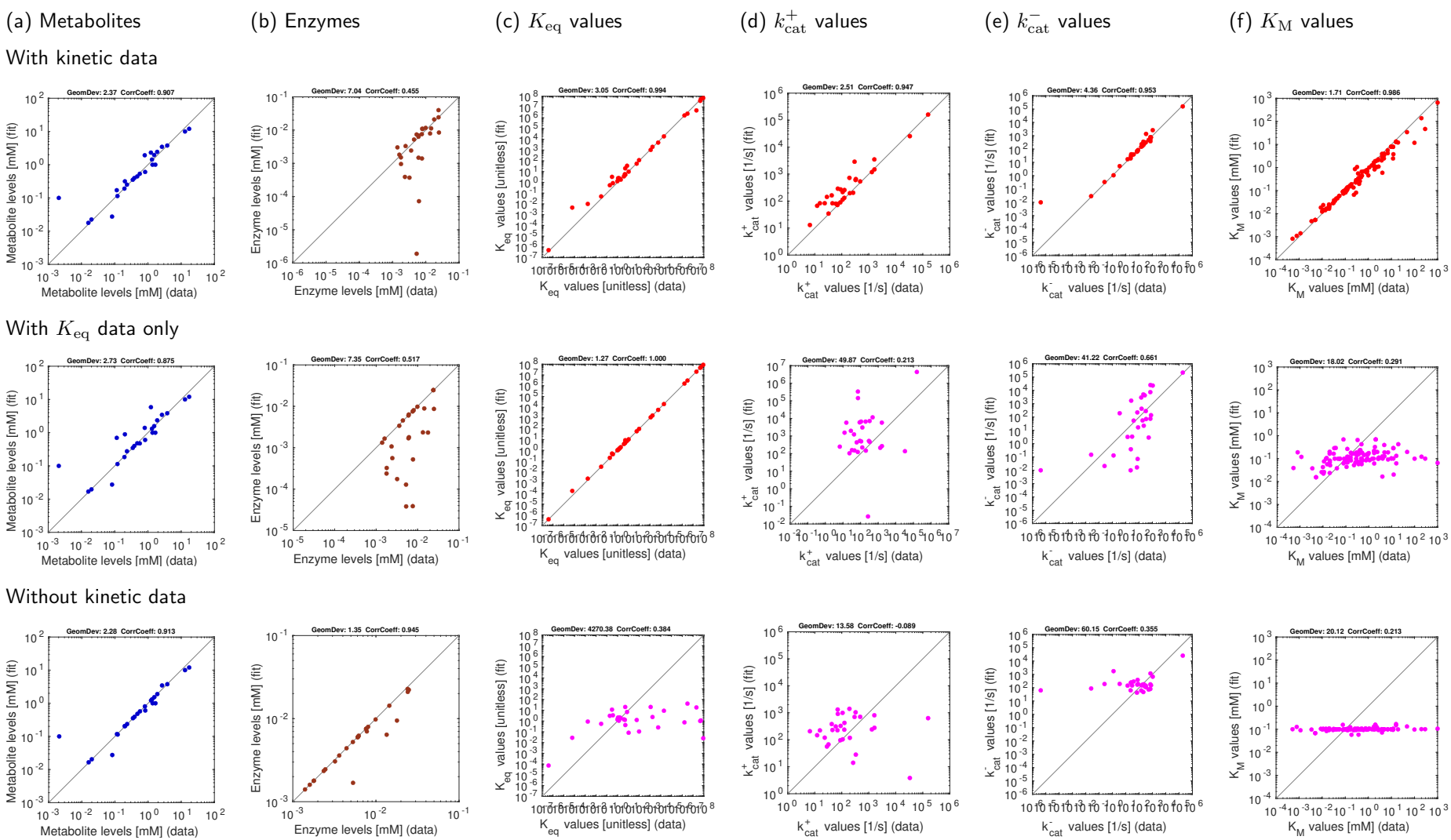


Figure 9: Results for *E. coli* central metabolism with experimental data (aerobic growth on glucose). The kinetic data stem from previous parameter balancing based on *in-vitro* data. Top: estimation using kinetic data. Centre: estimation using equilibrium constants as the only kinetic data. Centre: estimation using equilibrium constants as the only kinetic data. Bottom: estimation without usage of kinetic data. The same metabolite, enzyme, and kinetic data were used in [**?**].

E. coli central metabolism model (aerobic growth on glucose), in-vitro kinetic data

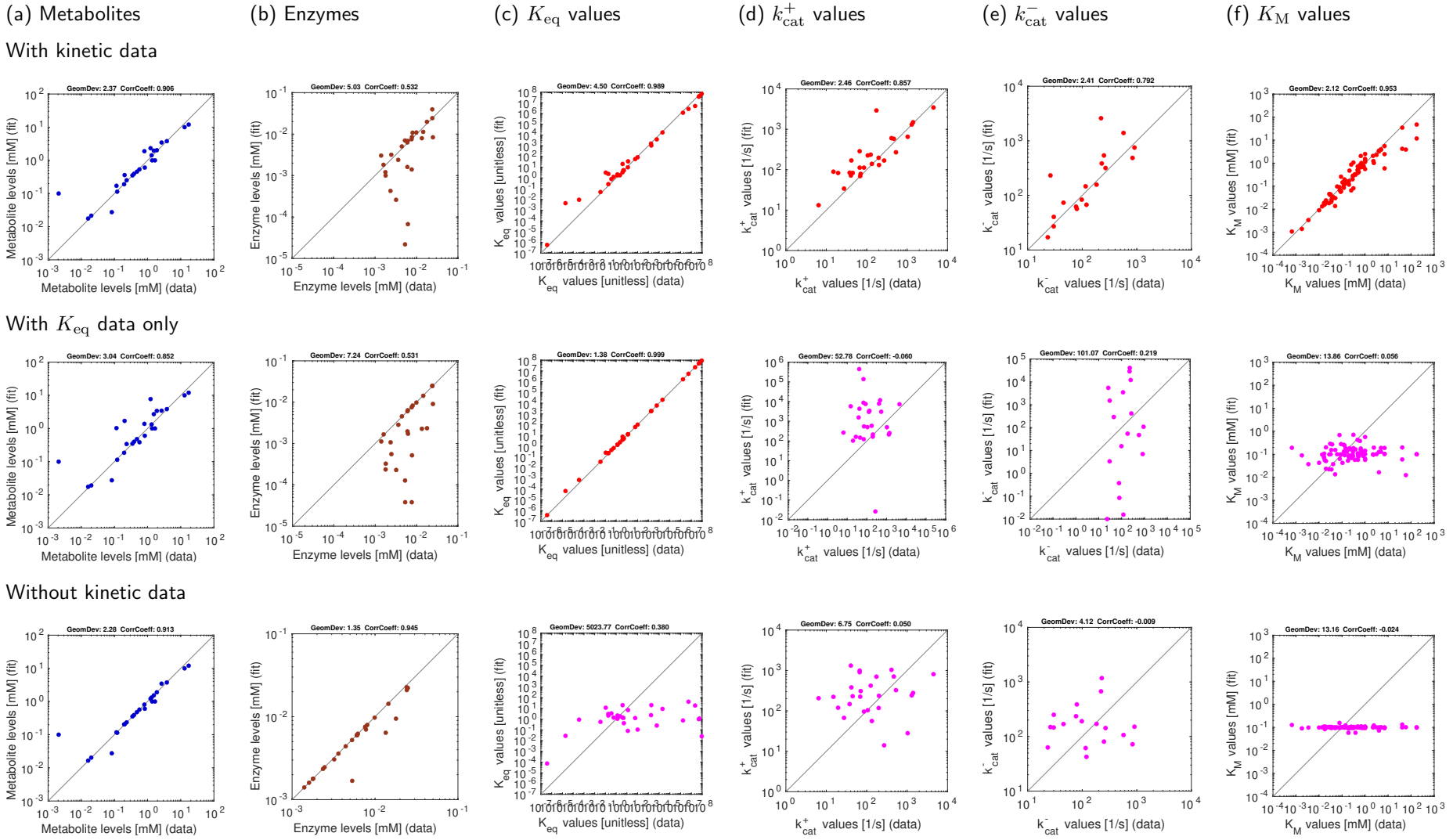


Figure 10: Results for *E. coli* central metabolism with experimental data (aerobic growth on glucose). Same as Figure 18, but based on original kinetic *in-vitro* data instead of balanced kinetic data.

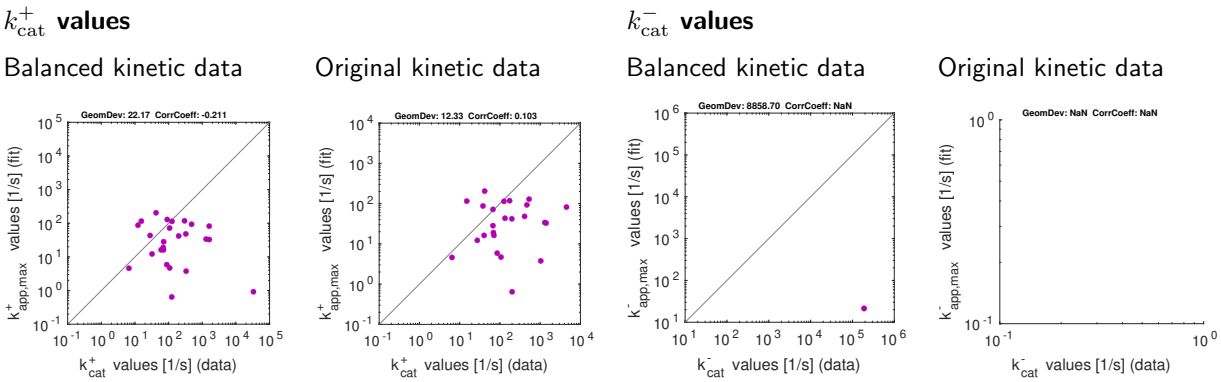


Figure 11: Catalytic constants in *E. coli* central metabolism model (aerobic growth on glucose), estimated by kinetic profiling [**?**].

4 E. coli Glucose data with alpha = 0.1

E. coli model (aerobic growth on glucose), balanced kinetic data

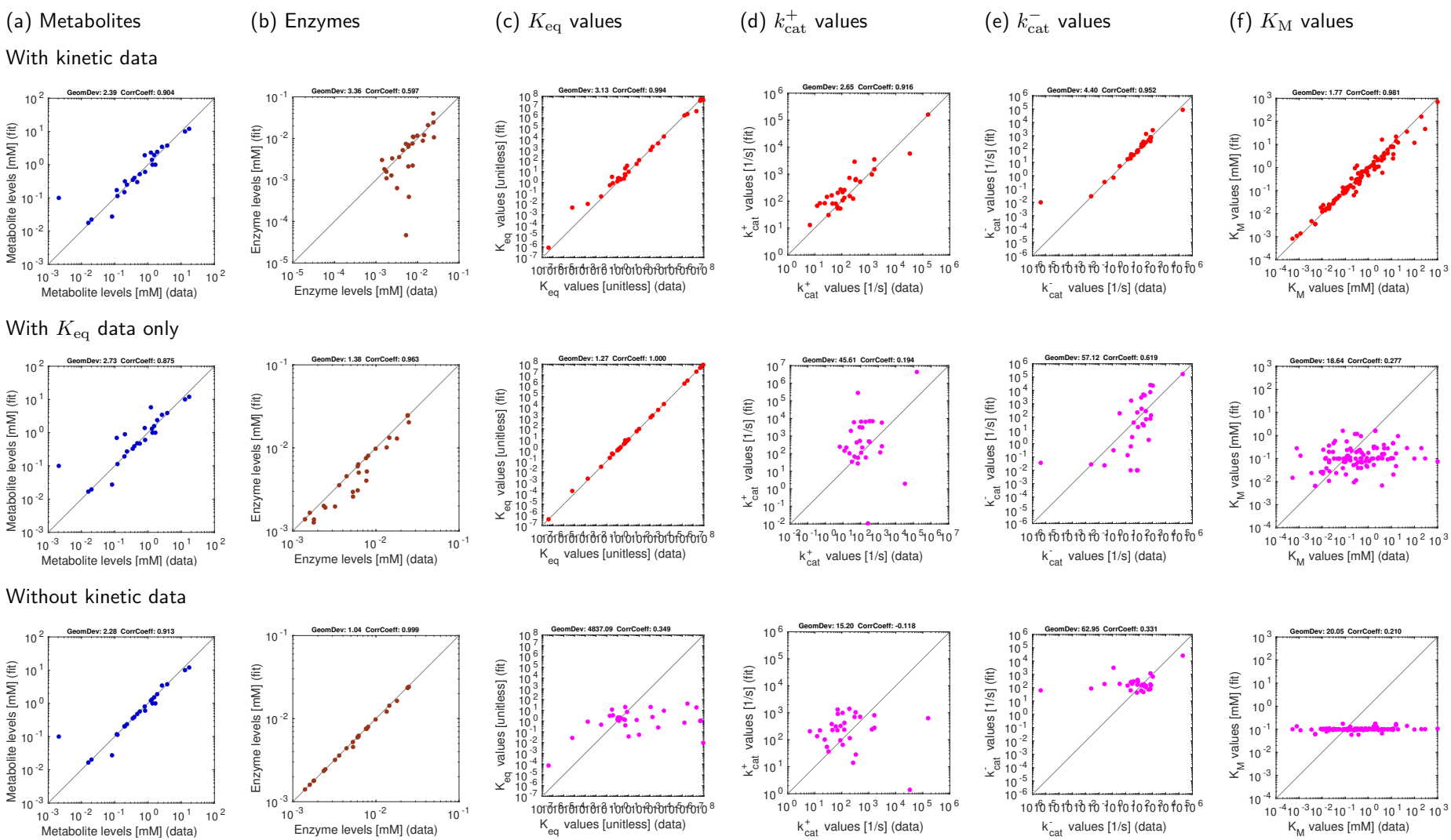
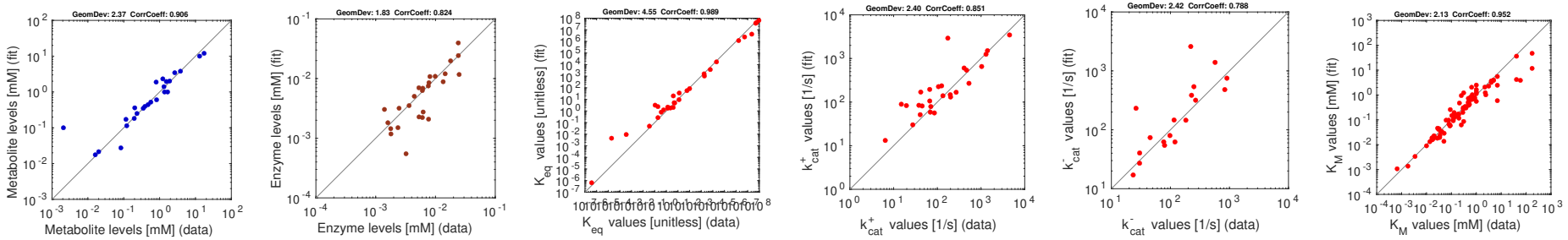


Figure 12: Results for *E. coli* central metabolism with experimental data (aerobic growth on glucose). The kinetic data stem from previous parameter balancing based on *in-vitro* data. Top: estimation using kinetic data. Centre: estimation using equilibrium constants as the only kinetic data. Centre: estimation using equilibrium constants as the only kinetic data. Bottom: estimation without usage of kinetic data. The same metabolite, enzyme, and kinetic data were used in [**?**].

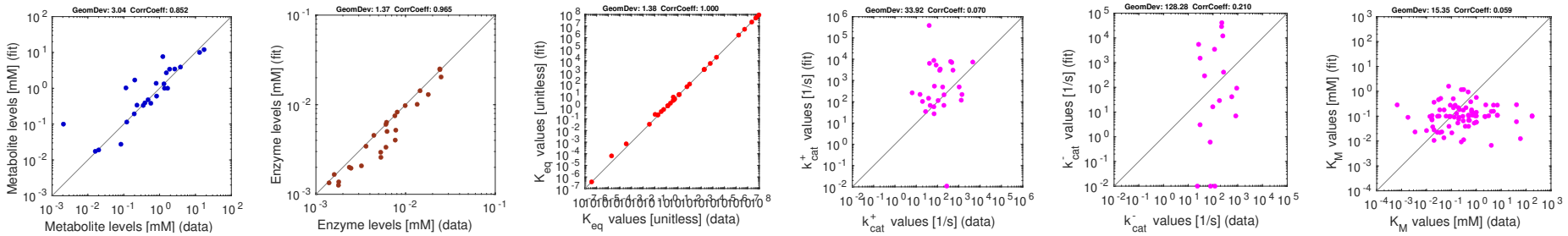
E. coli central metabolism model (aerobic growth on glucose), in-vitro kinetic data

(a) Metabolites (b) Enzymes (c) K_{eq} values (d) k^{+}_{cat} values (e) k^{-}_{cat} values (f) K_{M} values

With kinetic data



With K_{eq} data only



Without kinetic data

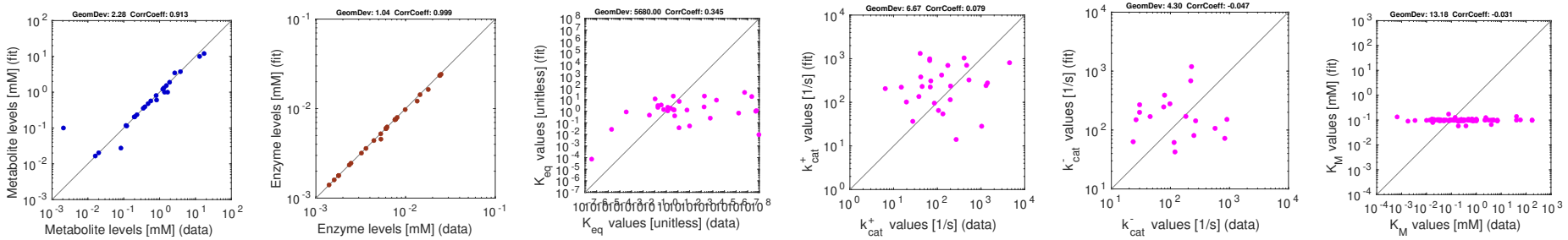


Figure 13: Results for *E. coli* central metabolism with experimental data (aerobic growth on glucose). Same as Figure 18, but based on original kinetic *in-vitro* data instead of balanced kinetic data.

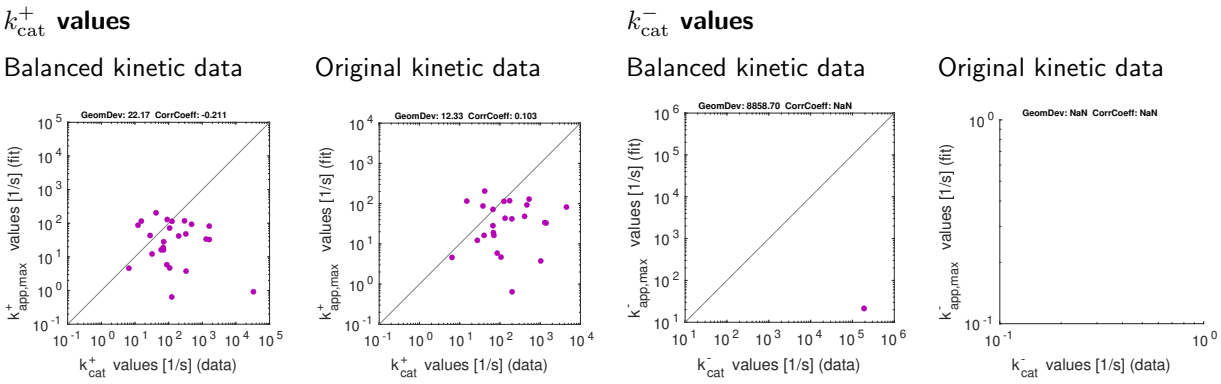


Figure 14: Catalytic constants in *E. coli* central metabolism model (aerobic growth on glucose), estimated by kinetic profiling [**?**].

5 E. coli Glucose data with alpha = 0.5

E. coli model (aerobic growth on glucose), balanced kinetic data

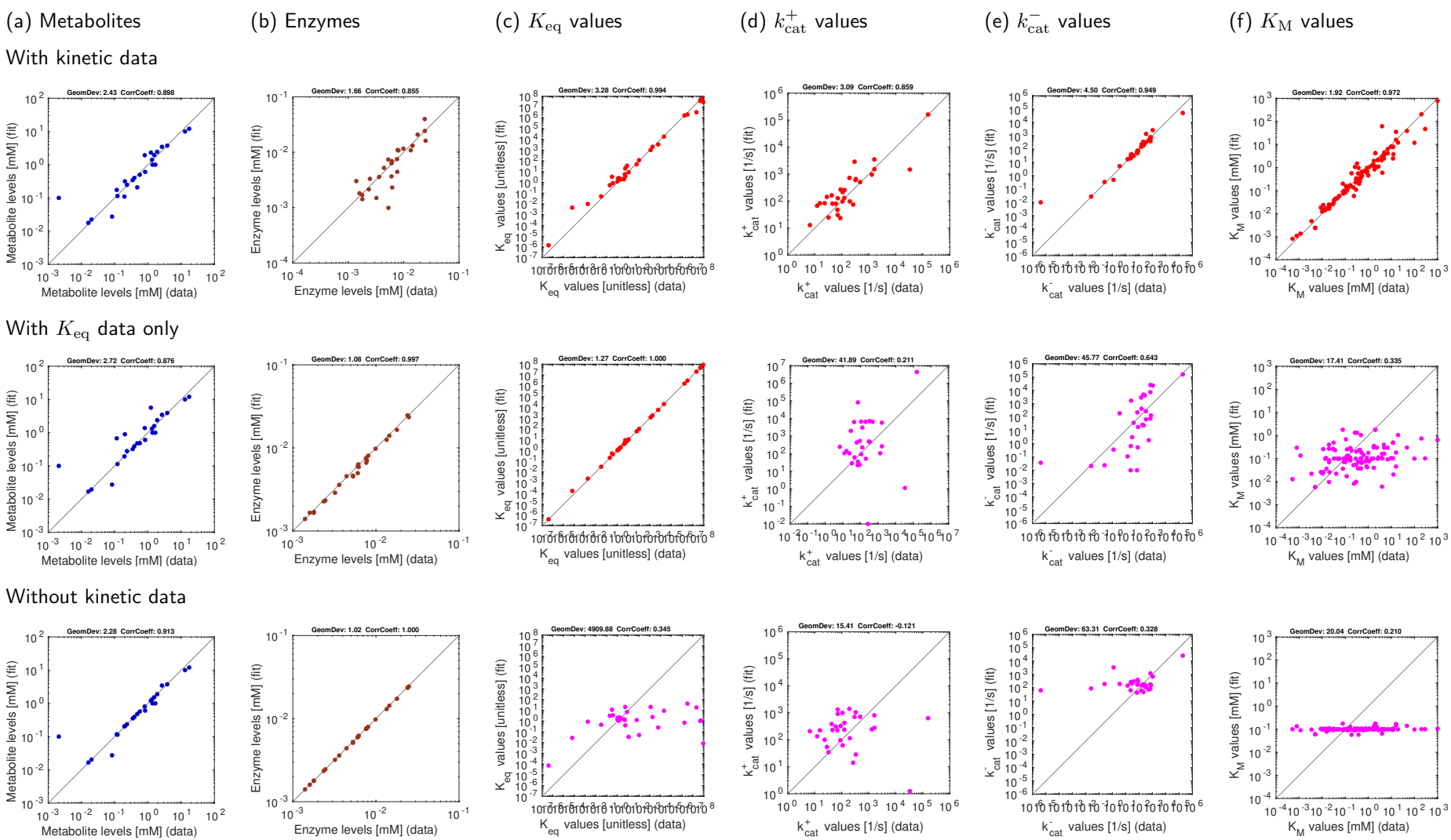


Figure 15: Results for *E. coli* central metabolism with experimental data (aerobic growth on glucose). The kinetic data stem from previous parameter balancing based on *in-vitro* data. Top: estimation using kinetic data. Centre: estimation using equilibrium constants as the only kinetic data. Centre: estimation using equilibrium constants as the only kinetic data. Bottom: estimation without usage of kinetic data. The same metabolite, enzyme, and kinetic data were used in [**?**].

E. coli central metabolism model (aerobic growth on glucose), in-vitro kinetic data

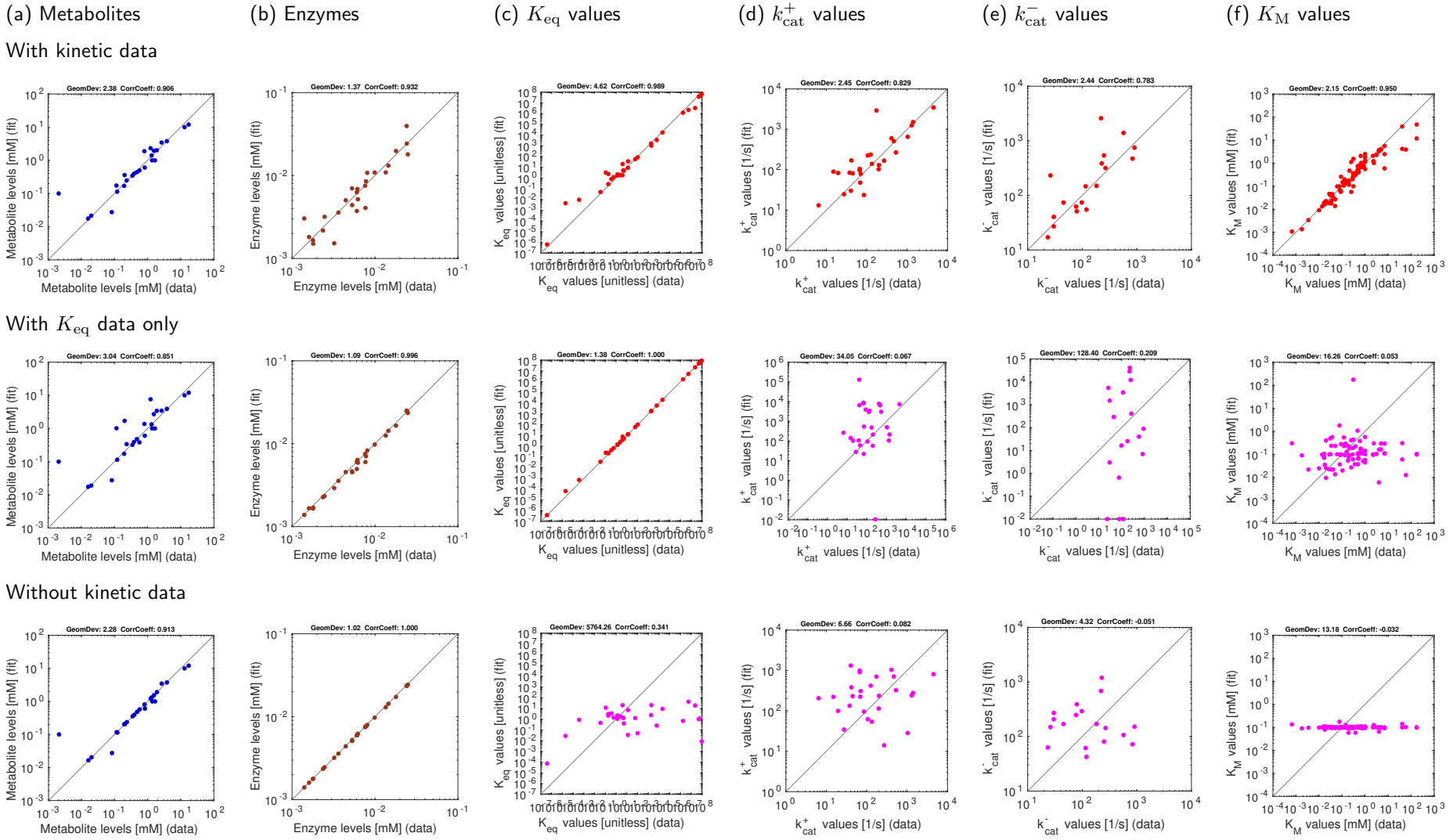


Figure 16: Results for *E. coli* central metabolism with experimental data (aerobic growth on glucose). Same as Figure 18, but based on original kinetic *in-vitro* data instead of balanced kinetic data.

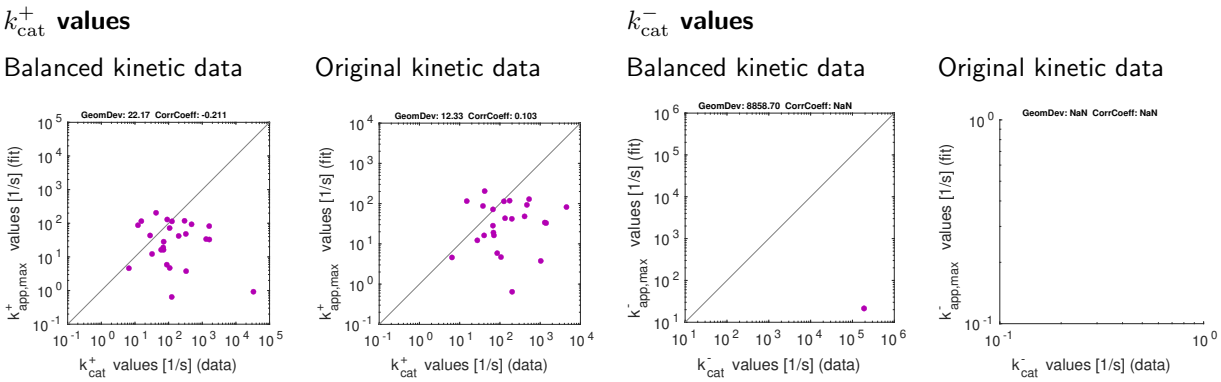


Figure 17: Catalytic constants in *E. coli* central metabolism model (aerobic growth on glucose), estimated by kinetic profiling [**?**].

6 E. coli Glucose data with alpha = 1

E. coli model (aerobic growth on glucose), balanced kinetic data

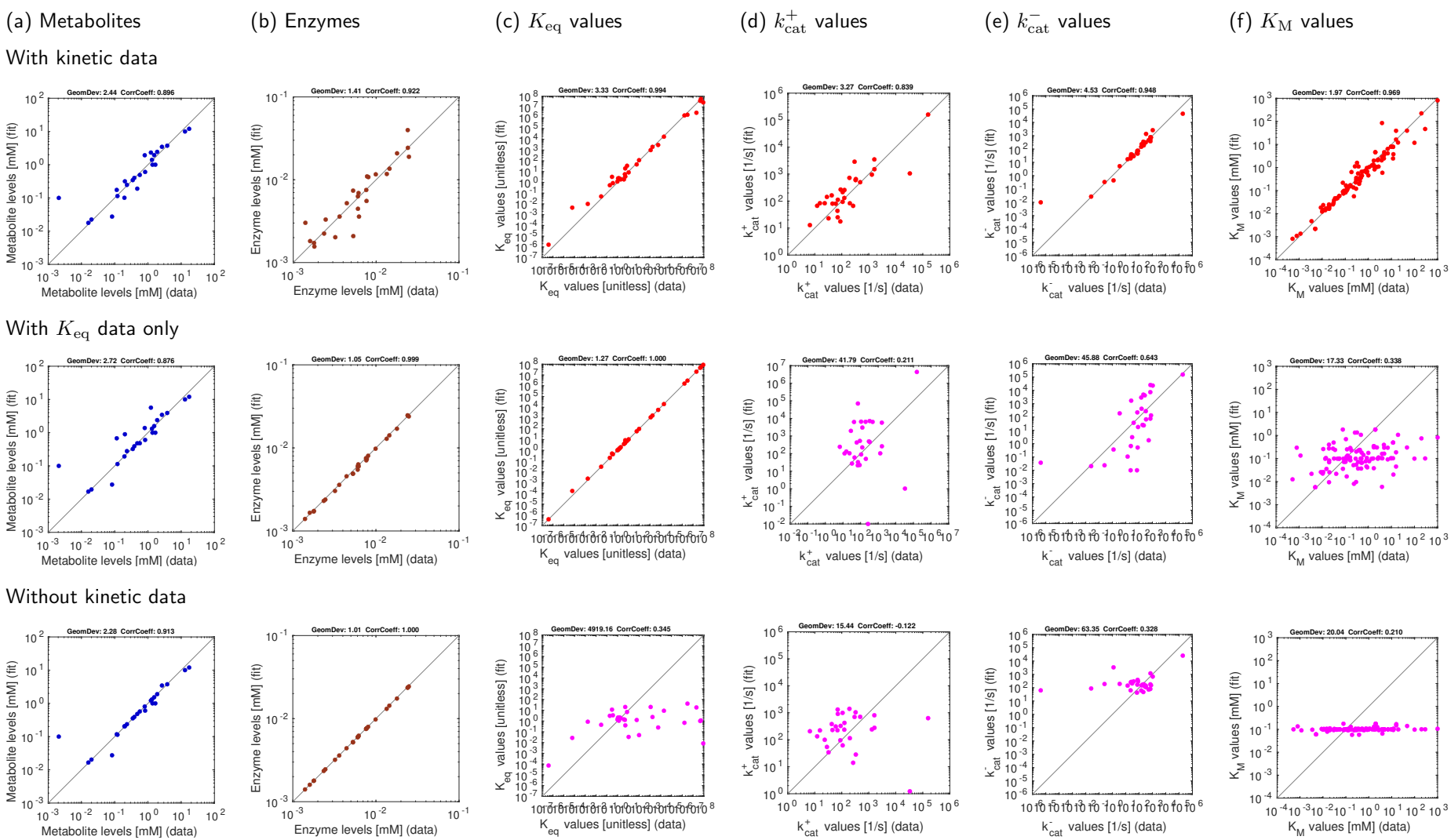
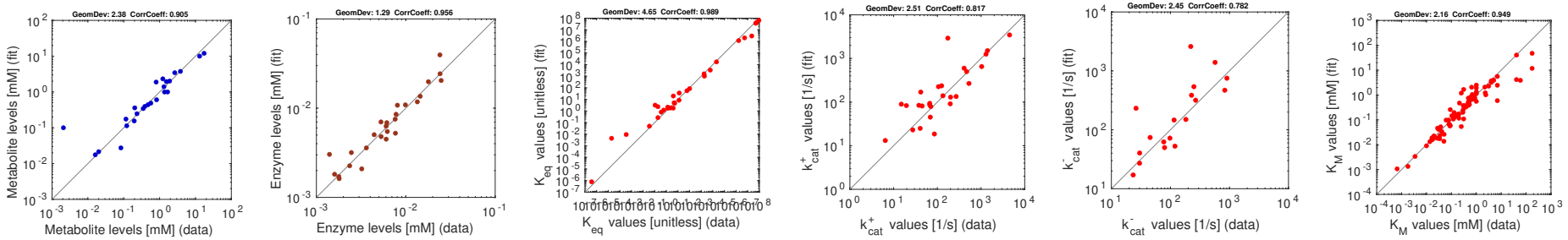


Figure 18: Results for *E. coli* central metabolism with experimental data (aerobic growth on glucose). The kinetic data stem from previous parameter balancing based on *in-vitro* data. Top: estimation using kinetic data. Centre: estimation using equilibrium constants as the only kinetic data. Centre: estimation using equilibrium constants as the only kinetic data. Bottom: estimation without usage of kinetic data. The same metabolite, enzyme, and kinetic data were used in [**?**].

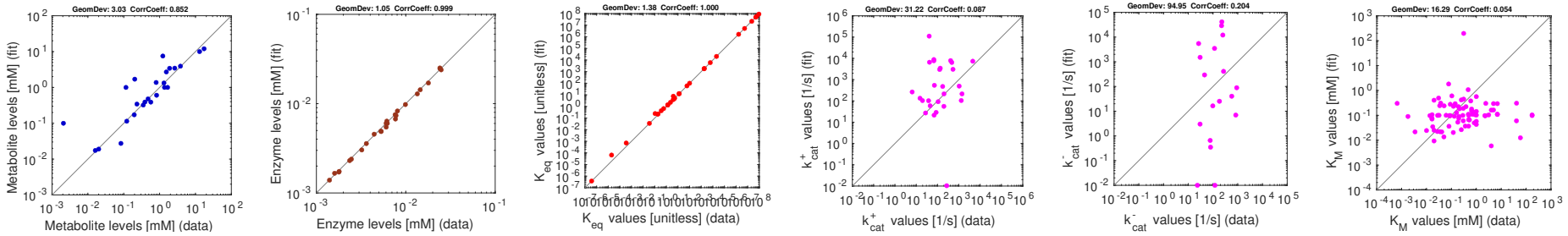
E. coli central metabolism model (aerobic growth on glucose), in-vitro kinetic data

(a) Metabolites (b) Enzymes (c) K_{eq} values (d) k^{+}_{cat} values (e) k^{-}_{cat} values (f) K_{M} values

With kinetic data



With K_{eq} data only



Without kinetic data

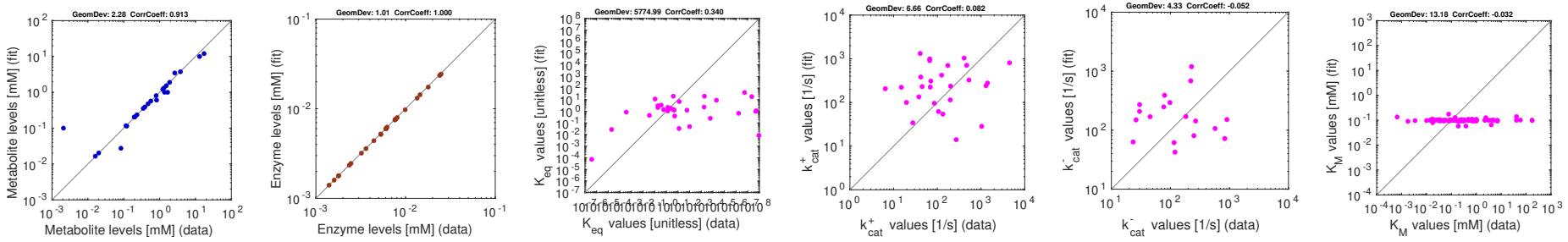


Figure 19: Results for *E. coli* central metabolism with experimental data (aerobic growth on glucose). Same as Figure 18, but based on original kinetic *in-vitro* data instead of balanced kinetic data.

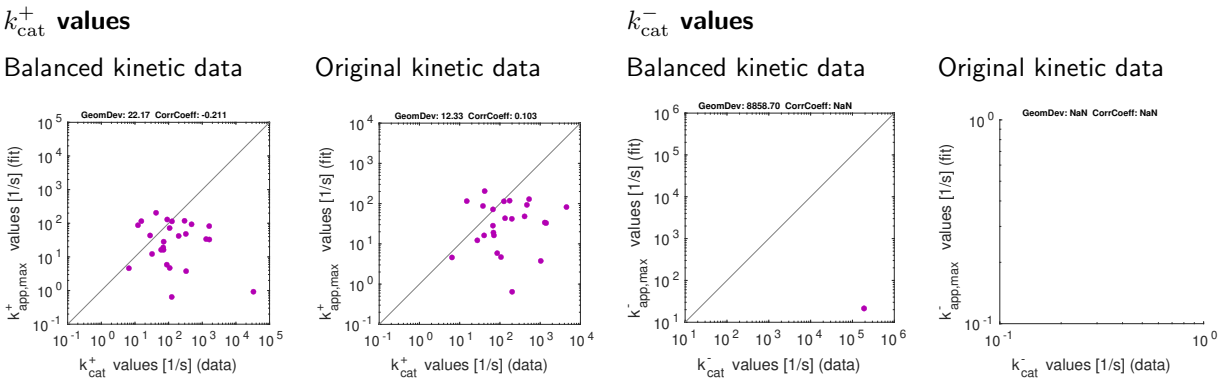


Figure 20: Catalytic constants in *E. coli* central metabolism model (aerobic growth on glucose), estimated by kinetic profiling [**?**].