PM₁₀ PM₂.₅

Figure S1. Monthly mean values of PM$_{10}$ and PM$_{2.5}$ [μgm^{-3}] August 2017: (**a**) and (**c**) BgCWFS_mod; (**b**) and (**d**) BgCWFS_sat.
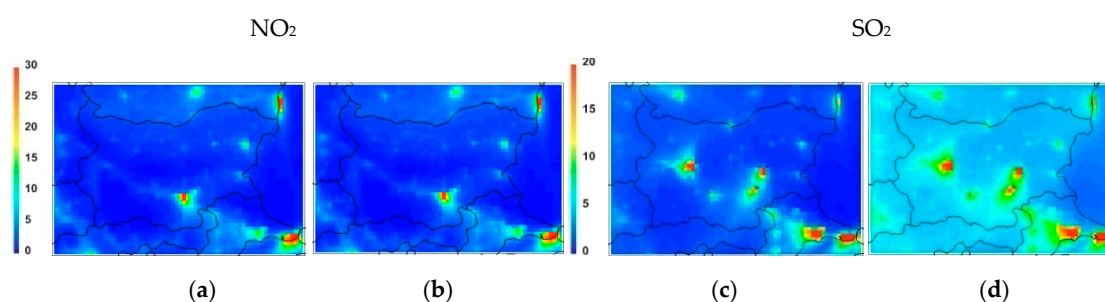
NO₂ SO₂

Figure S2. Monthly mean values of NO$_2$ and SO$_2$ [μgm^{-3}], August 2017: (**a**) and (**c**) BgCWFS_mod; (**b**) and (**d**) BgCWFS_sat.

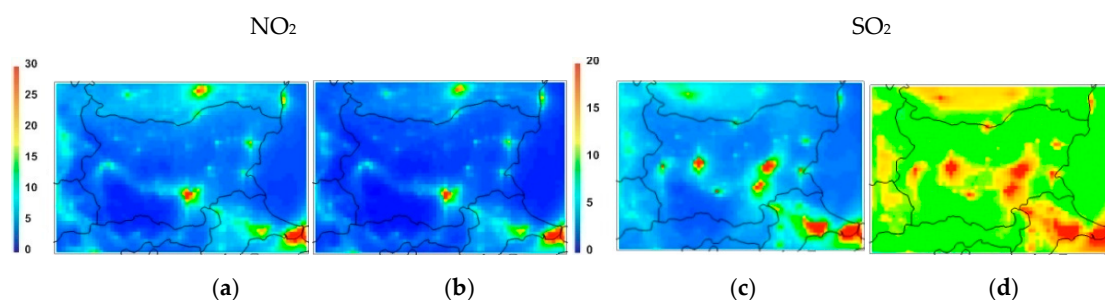**Figure S3.** Monthly mean values of PM$_{2.5}$ [μgm^{-3}], February 2019: (**a**) BgCWFS_mod; (**b**) BgCWFS_sat.

NO₂ SO₂

Figure S4. Monthly mean values of NO$_2$ and SO$_2$ [μgm^{-3}], February 2019: (**a**) and (**c**) BgCWFS_mod; (**b**) and (**d**) BgCWFS_sat.
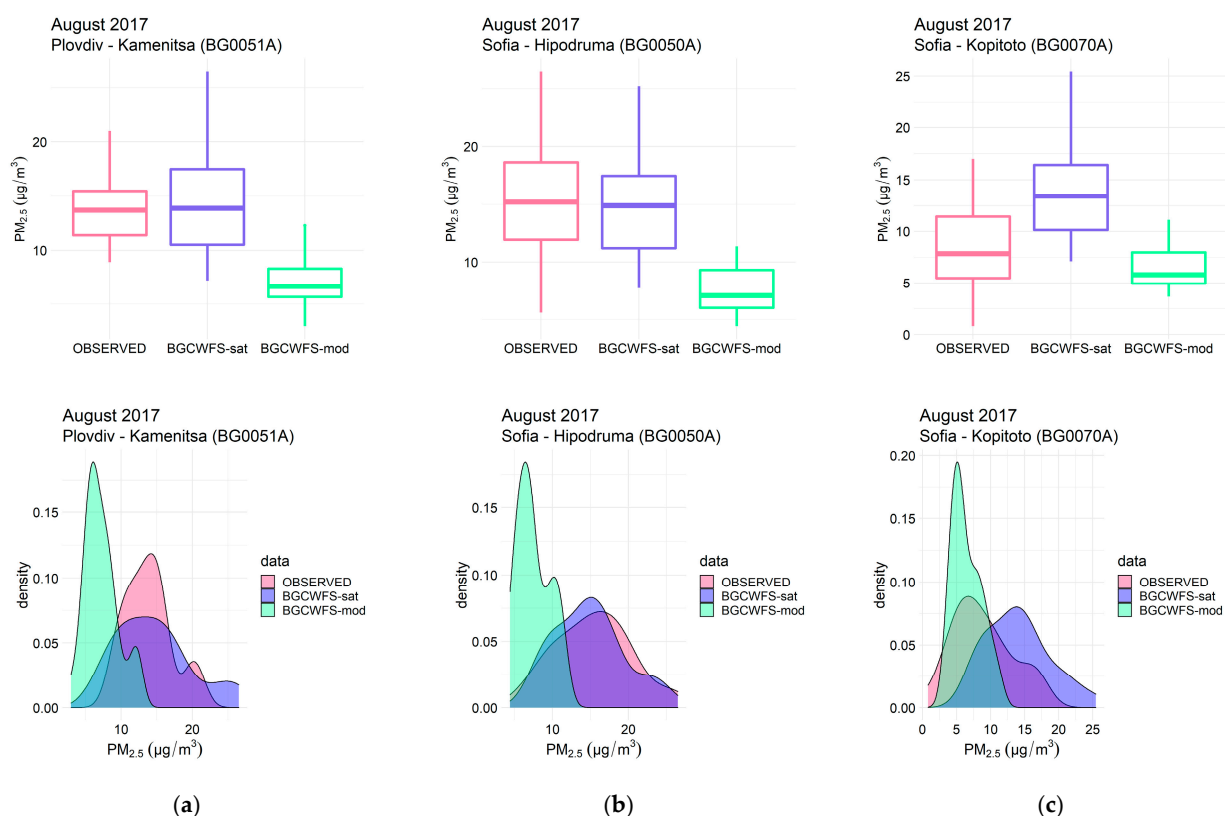
Figure S5. PM25 in August 2017 - observed, BgCWFS_sat and BgCWFS_mod at 3 selected stations: (**a**) Plovdiv-Kamenitza (BG0051A); (**b**) Sofia-Hipodruma (BG0050A); and (**c**) Sofia-Kopitoto (BG0070A); top panels - boxplots show minimum, maximum, 25th, 50th and 75th percentiles, bottom panels – kernel density estimations of the density distribution functions

Figure S6. NO$_2$ in August 2017 - observed, BgCWFS_sat and BgCWFS_mod at 3 selected stations: (**a**) Plovdiv-Kamenitza (BG0051A); (**b**) Sofia-Drujba (BG0052A); and (**c**) Sofia-Kopitoto (BG0070A); top panels - boxplots show minimum, maximum, 25th, 50th and 75th percentiles, bottom panels – kernel density estimations of the density distribution functions
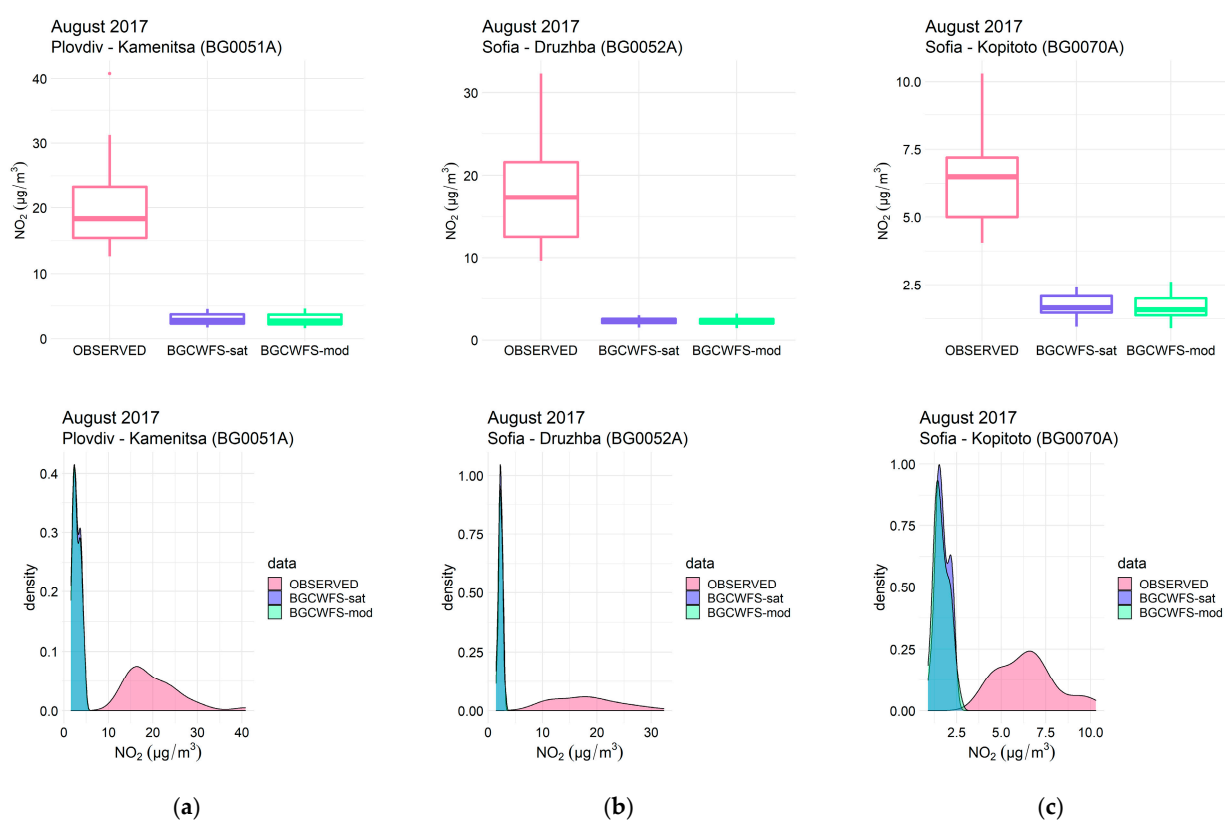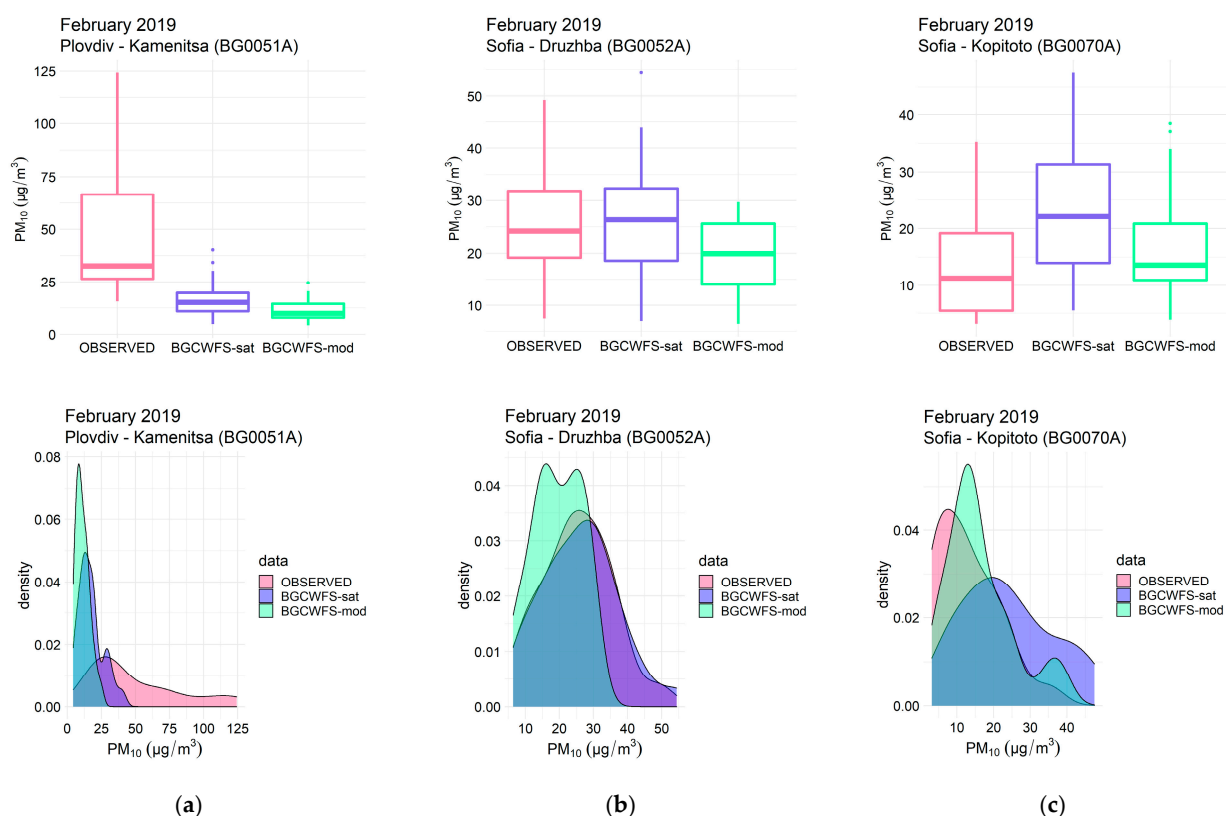

(**a**)　　　　　　　　　(**b**)　　　　　　　　　(**c**)

Figure S7. PM$_{10}$ in February 2019 - observed, BgCWFS_sat and BgCWFS_mod at 3 selected stations: (**a**) Plovdiv-Kamenitza (BG0051A); (**b**) Sofia Drujba (BG0052A); and (**c**) Sofia-Kopitoto (BG0070A); top panels - boxplots show minimum, maximum, 25th, 50th and 75th percentiles, bottom panels – kernel density estimations of the density distribution functions
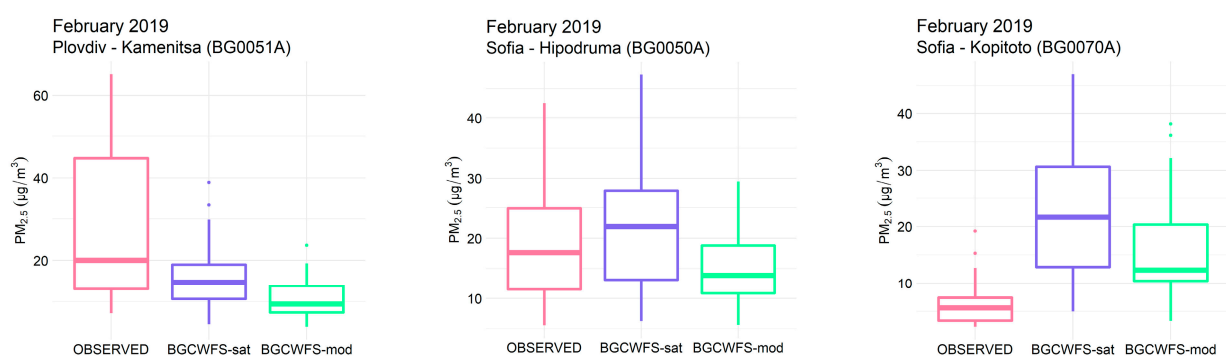
Figure S8. PM₂₅ in February 2019 - observed, BgCWFS_sat and BgCWFS_mod at 3 selected stations: (**a**) Plovdiv-Kamenitza (BG0051A); (**b**) Sofia-Hipodruma (BG0050A); and (**c**) Sofia-Kopitoto (BG0070A); top panels - boxplots show minimum, maximum, 25th, 50th and 75th percentiles, bottom panels – kernel density estimations of the density distribution functions
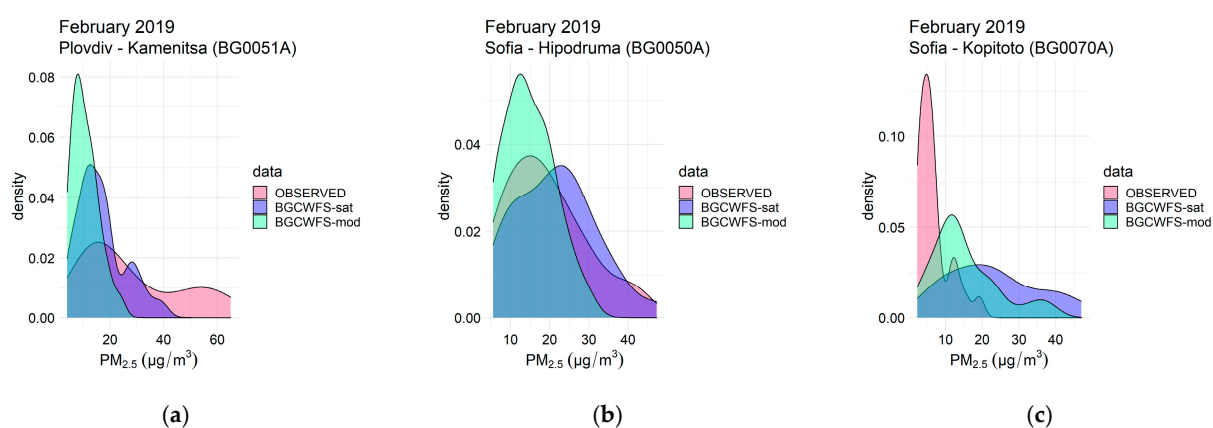

Figure S9. NO₂ in February 2019 - observed, BgCWFS_sat and BgCWFS_mod at 3 selected stations: (**a**) Plovdiv-Kamenitza (BG0051A); (**b**) Sofia-Drujba (BG0052A); and (**c**) Sofia-Kopitoto (BG0070A); top panels - boxplots show minimum, maximum, 25th, 50th and 75th percentiles, bottom panels – kernel density estimations of the density distribution functions
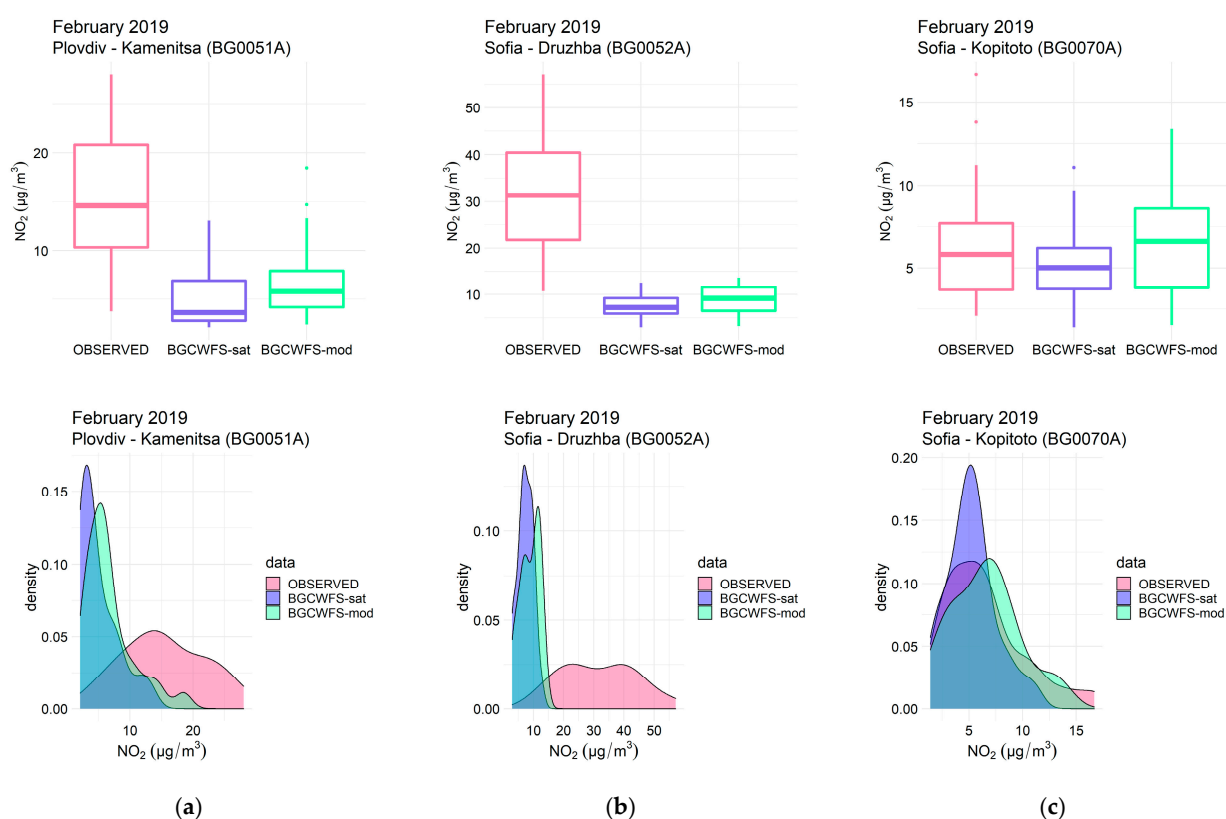
Figure S10. SO₂ in February 2019 - observed, BgCWFS_sat and BgCWFS_mod at 3 selected stations: (**a**) Plovdiv-Kamenitza (BG0051A); (**b**) Sofia-Drujba (BG0052A); and (**c**) Sofia-Kopitoto (BG0070A); top panels - boxplots show minimum, maximum, 25th, 50th and 75th percentiles, bottom panels – kernel density estim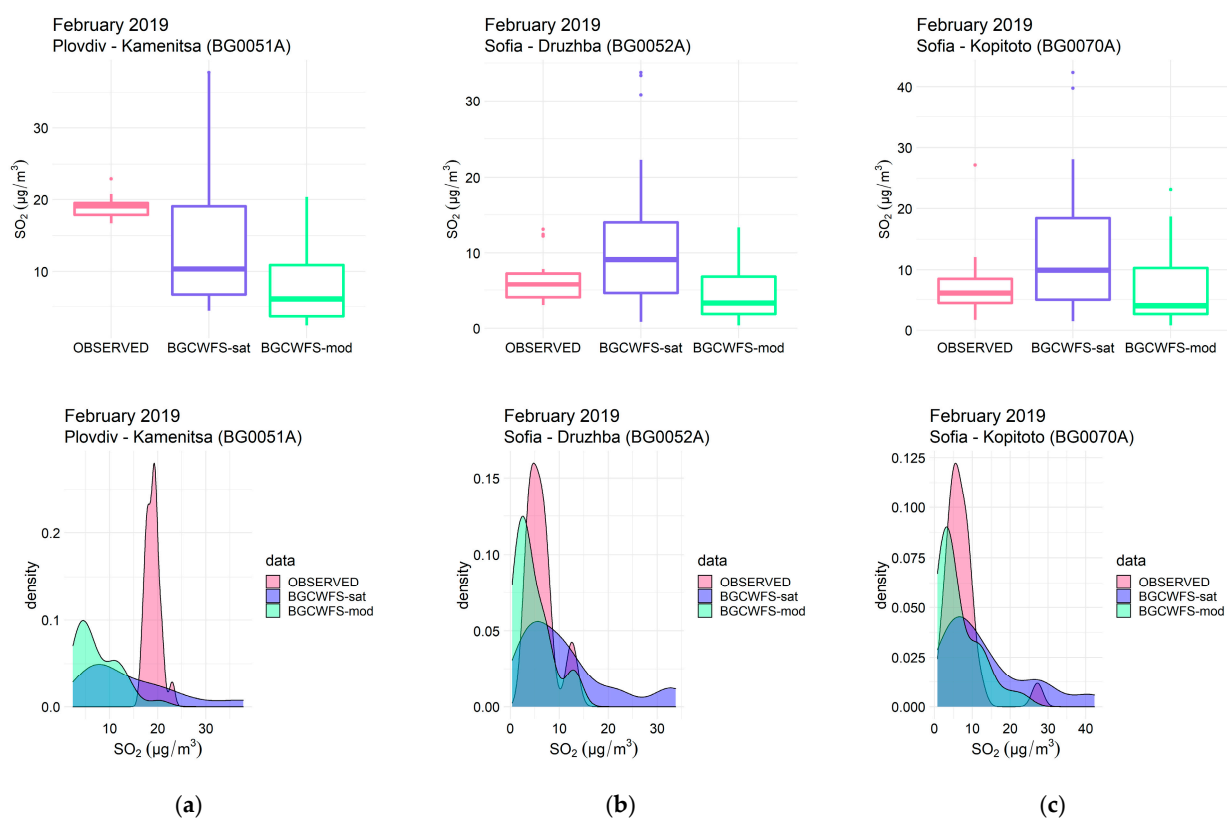ations of the density distribution functions