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Radiation hydrodynamic simulations with CO5BOLD (in 2D & 3D) and the HDW code (in 2D) have been used to produce numerical models of the convective surface layers of a number of stars, including the Sun, white dwarfs of type DA, and red supergiants.

While granulation of main-sequence solar-type stars resembles that of the Sun, the convective velocity fields of F-type stars are much more violent and accompanied by strong pulsations. The properties of the very thin (compared to the Sun) convection zone(s) of A-type stars differ again. In this contribution, the pattern and dynamics of their surface granulation, the photospheric velocity fields and their effect on line profiles will be investigated. Furthermore, a look will be taken below the surface to study overshoot and the interaction of the surface convection zone and the deeper Helium II convection zone.
