

Particles at two levels [tln91]

The notion of particles populating orbitals is useful as introductory device but of limited scope. More generally, particles populate a reference state (pseudo-vacuum), divided into units of some kind, depending on the application.

It is useful to introduce the distinction of two levels at which particles occupy units of the pseudo-vacuum.

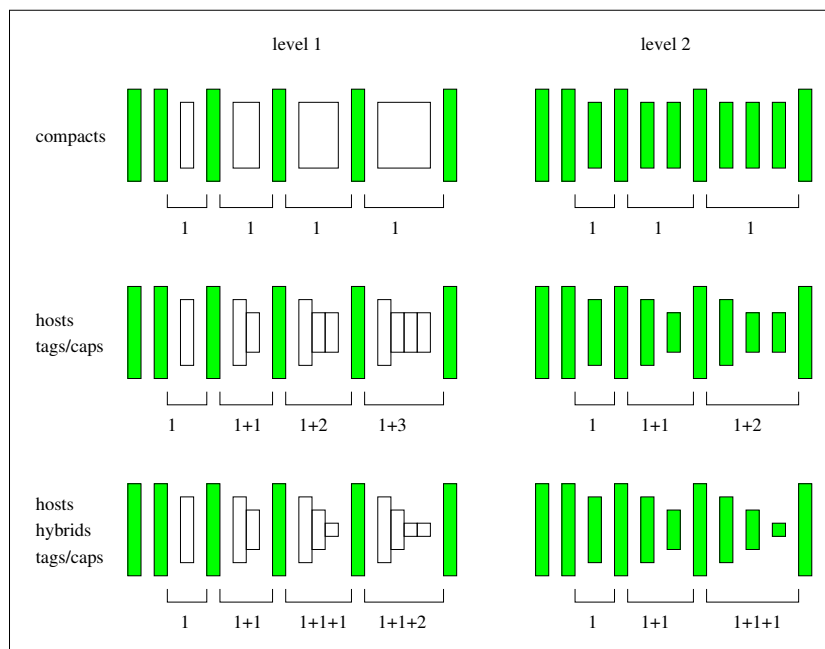
- ▷ Particles at level 1 occupy single units.
- ▷ Particles at level 2 occupy multiple units.

Statistically interacting particles at both levels can be compact or nested.¹

It is likely that the two-level distinction requires some fine-tuning to make it generally useful.

In the context of polymeric chains, for a specific example, the units of the pseudo-vacuum are bonds between successive monomers.²

- ▷ Particles at level 1 modify single bonds.
- ▷ Particles at level 2 modify segments of monomers including their bonds.



¹Compact particles exist side by side. Nested particles (hosts, hybrids, tags, and caps) envelop one another in a metaphorical sense.

²Meyer et al. 2018.

- Monomers are represented by filled rectangles (six at level 1, eleven at level 2).
- Particles at level 1 are represented by open rectangles (modified bonds).
- Particles at level 2 are represented by filled rectangles (modified segments of monomers).
- Placing a particle at level 1 or level 2 affects the number of open slots for further particles very differently.
- The capacity for tags is unlimited at level 1, but limited at level 2.