

The spdf Atomic Orbital Model - A Violation of Common Space Physics

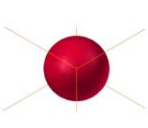
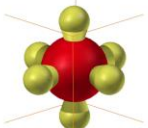
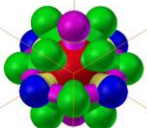
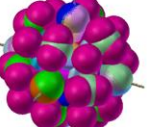
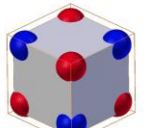
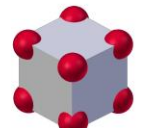
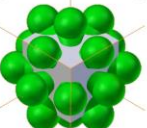
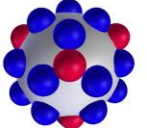
By Joel M Williams (text and images © 2013)

Abstract

This one-page brief has a single focus: the violation of common physical space by the spdf orbitals as they “collectively” accommodate electrons around a nucleus.

The currently espoused, spdf, electron orbital model is widely taught at all levels of education. The spdf orbitals are presented, studied, and applied in separate or hybridized forms, but seldom viewed from the perspective of their “collective physical totality” around a nucleus. [A pyramidal chart of the spdf orbitals \(singularly and collectively\) can be found elsewhere.](#) This one-page brief has a single focus: the violation of common physical space by the spdf orbitals as they “collectively” accommodate electrons around a nucleus.

The top row in the figure below illustrates how the spdf model accommodates electrons at the various loadings required by the elements that form the various n-levels of the periodic table.

Accommodating Atomic Electrons at the Same Period Level				
# e in level	2	8	18	32
spdf Model				
Orbitals/Lobes/Tori	1/1/0	4/7/0	9/25/1	16/67/3 Cubic 16/63/7 General
MCAS Model				
Lobes	M2x4	C8	A18	SC32

The spdf model accommodates additional electrons of the same period by having them occupy some of the space already occupied by other electrons. Electrons are said to be able to coexist in an orbital of a set (s, p, d, or f) through “spin-reversed pairing”. Apparently, even more electrons can coexist in areas where the sets overlap. What counter-intuitive mechanism allows “two’s company, three’s a crowd” to become communal without any of them repelling any other? Note that this just addresses the agglomeration for one “n-level”. The situation is compounded when other n-levels are added to the mix. One would expect the “atomic machinery” to be more orderly than this.

Consider the logic of providing separate orbital spaces for the electrons as the MCAS model does.

[Details of both models are presented elsewhere.](#)

The objective here is simply to draw attention to the violation of common space physics by the spdf orbital model on top of the other counter-intuitive physics assumptions and hybridizations that have been made in order to foster it.