

A **Smarandache Strong-Weak Structure** on a set S means a structure on S that has two proper subsets: P with a stronger structure, and Q with a weaker structure.

By *proper subset* of a set S , we mean a subset P of S , different from the empty set, from the original set S , and from the idempotent elements if any.

In any field, a *Smarandache strong-weak n -structure* on a set S means a structure $\{w_0\}$ on S such that there exist two chains of proper subsets $P_{n-1} < P_{n-2} < \dots < P_2 < P_1 < S$ and $Q_{n-1} < Q_{n-2} < \dots < Q_2 < Q_1 < S$, where ' $<$ ' means 'included in', whose corresponding stronger structures verify the chain $\{w_{n-1}\} > \{w_{n-2}\} > \dots > \{w_2\} > \{w_1\} > \{w_0\}$ and respectively the weaker structures verify the chain $\{v_{n-1}\} < \{v_{n-2}\} < \dots < \{v_2\} < \{v_1\} < \{v_0\}$, where ' $>$ ' signifies 'strictly stronger' (i.e. structure satisfying more axioms) and ' $<$ ' signifies 'strictly weaker' (i.e. structure satisfying less axioms).

And by *structure* on S we mean a structure $\{w\}$ on S under the given operation(s).

As a particular case, a *Smarandache strong-weak 2-structure* (two levels only of structures in algebra) on a set S , is a structure $\{w_0\}$ on S such that there exist two proper subsets P and Q of S , where P is embedded with a stronger structure than $\{w_0\}$, while Q is embedded with a weaker structure than $\{w_0\}$.

For example, a **Smarandache strong-weak monoid** is a monoid that has a proper subset which is a group, and another proper set which is a semigroup.

Also, a **Smarandache strong-weak ring** is a ring that has a proper subset which is a field, and another proper subset which is a near-ring.

See also:

- [Smarandache Strong Structures](#)
- [Smarandache Weak Structures](#)