

# The Law of Increasing Degree of Su-Field

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Key words: TRIZ, Laws of Technical Systems Evolution, Su-Field Analysis.

## 1. Introduction

The law of increasing degree of Su-Field was formulated by Genrich Altshulelr:

**'Development of technical systems is going towards increasing degree of Su-Filed.**

The meaning of this law is that non Su-Filed systems tend to become Su-Filed and in Su-Filed systems a development is going towards transition from mechanical to electromagnetic fields; increase of degree of fragmentation and the number of connection of elements and system response'[1].

In works [2] and [3] Altshuller has described a mechanism of the law of increasing degree of Su-Field. A development is going form non Su-field system to a simple Su-Filed system, then to complex Su-Filed (internal, external, and based on environment and modified substance of environment), then towards chain Su-Filed, double Su-Filed and forced Su-Filed.

The author of the article enhanced the conception of this law [4]. In this article the author elaborates on the general sequence of Su-Fields development and introduces additional trends.

## 2. The law of increasing degree of Su-Field

**The law of increasing degree of Su-Field states that any technical system in its development tends to become more Su-Field like, i.e. its degree of Su-filed has to increase.**

This law includes **trends** that describe sequence of **structure and elements change** (substance and field) **of Su-Filed** in order to gain more controllable technical systems, i.e. **more ideal systems**. During the process of changing it is necessary **to coordinate of substances, fields and structure**.

**The general trend of Su-Filed development** (figure 1), constitutes transitions form **non-Su-Field** system towards **simple Su-Filed**. At the next stage **change** and

**coordination of substances and fields.** Then there is a **change of Su-Filed structure** and at last there is a transition towards **forced Su-Field** [4].

*Su-Fields are transformed* using trends in Su-Field evolution in order to **increase effectiveness of technical systems** and to **eliminate harmful interaction in them.** These transformations are done by changing of **substance, field and/or structure** (partially or completely), **in space, in time or by condition.**



Figure 1. General trend of Su-Filed evolution

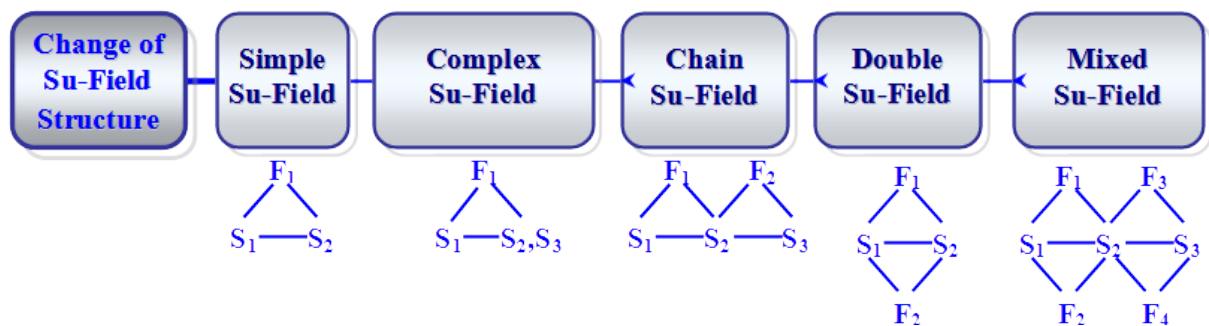


Figure 2. Trend of Su-Filed structure change

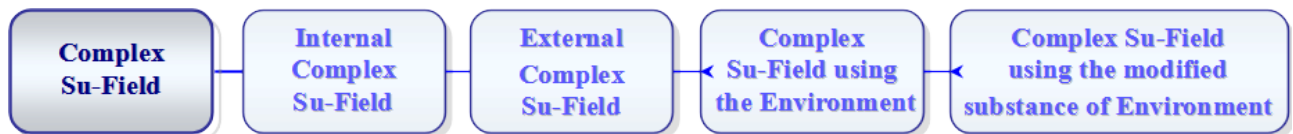


Figure 3. Trend of complex Su-Field change

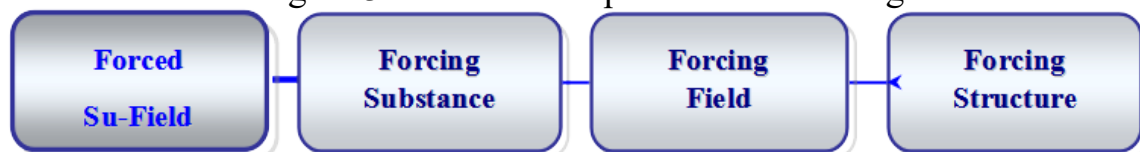


Figure 4. Trend of forced Su-Field change

**The change of substances and fields** starts form matching '**responsive**' substance to **the field** at hand and **the field that is 'responsive' to the substance** or '**responsive**' pair (**substance - field**) at hand. By matching '**responsive**' substances and fields we perform their **coordination.**

### 3. Forced Su-Field.

#### 3.1. General trend.

To increase an efficiency of Su-Field systems there is a need to use more controllable Su-Fields that are **forced Su-Fields**.

**Forced Su-Field** is a Su-Field that uses **more controllable substances, fields and structures**.

The structure of Forced Su-Filed is shown on figure 4.

### 3.2 The forcing of substances

**The forcing of substances** is done by transition towards **more controllable substances** that are subject to the Change of Constraint Degree Law and by transition to more *progressive* (“**smart**”) **substances**.

This trend is shown on figure 5.

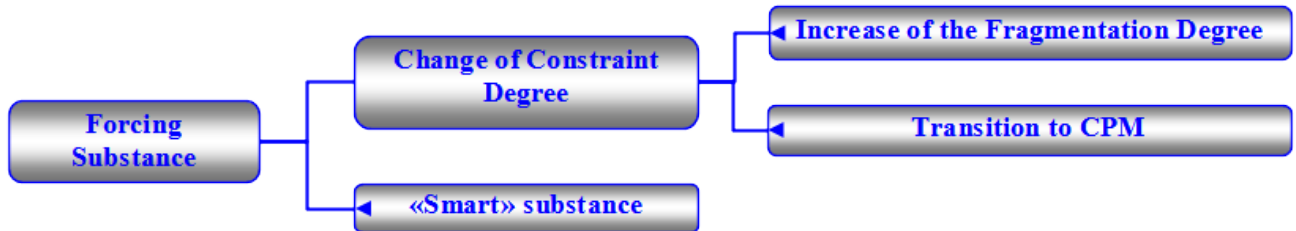


Figure 5. Trend of substances forcing

**The Change of Constraint Degree Law** is substantiated by trends of **Degree of Fragmental Increase** [5] and by **transition to the capillary-porous materials (CPM)** [6]. This trend is shown on figure 6.

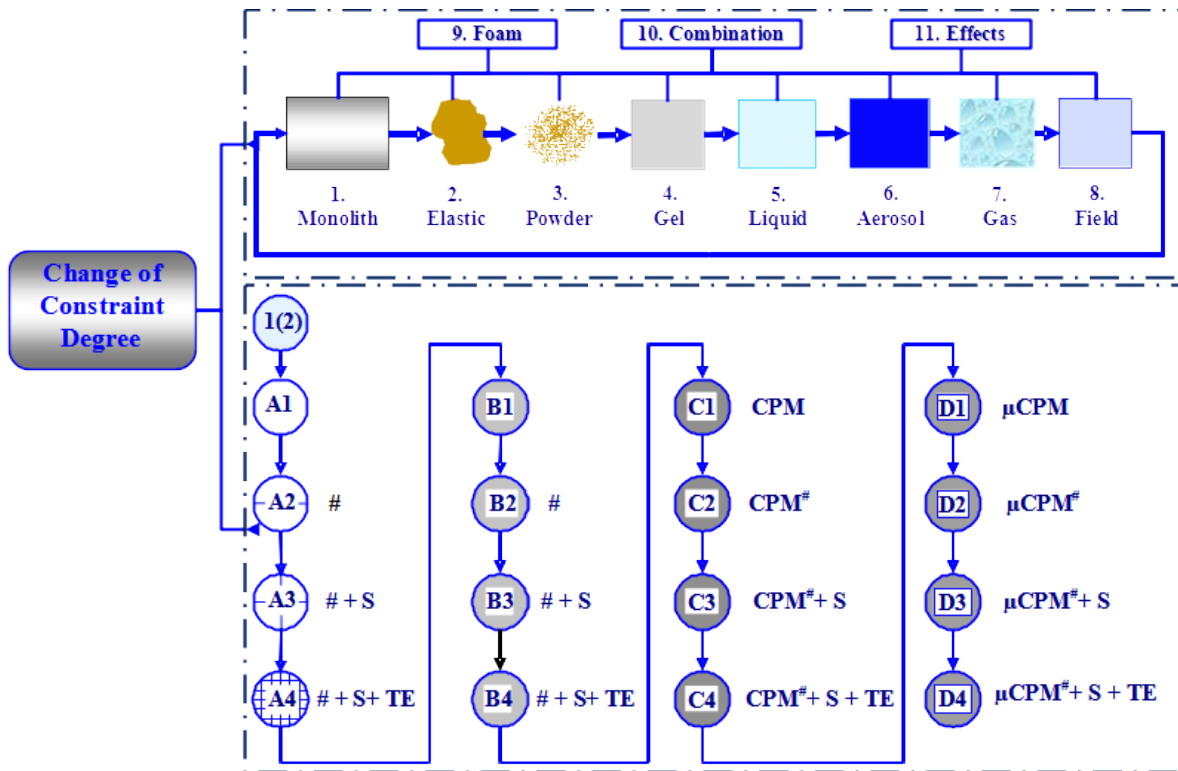


Figure 6. Trend of Change of Constraint Degree law

**A 'Smart' substance** is a substance that is responsive to a specific field. It is able to carry out concrete function under the influence of this field through the use of effects (physical, chemical or biological).

### 3.3 Forcing of Fields

**The forcing of Fields** is a subject of **Transition to Micro-level Law** and **Increase of Energy Density and Information Density law** [7]. The trend of forcing Fields is shown on figure 7. As a rule a usage of more controllable fields associated with the use of technological effects.

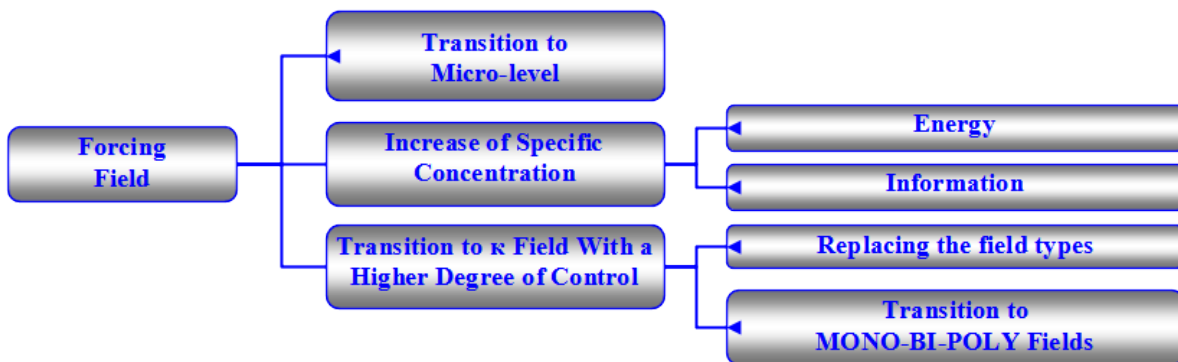


Figure 7. Trend of Forcing Fields

The main trend of changes of a field type to a more controlled field is shown on figure 8.

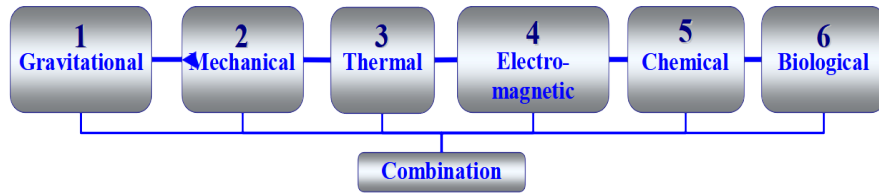


Figure 8. Trend of changes of a field type to a more controlled field  
**The forcing of Su-Field structure is done by transition from simple forcing Su-Field to complex forcing Su-Filed, then to chain forcing Su-Filed, then to double forcing Su-Filed and to mixed forcing Su-Field (figure 9).**

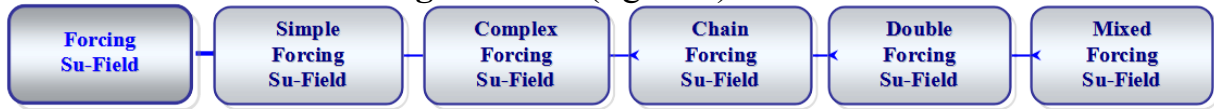


Figure 9. Trend of forcing structure of Su-Field  
 Complex forcing Su-Fields (figure 10) can be internal and external complex forcing Su-Fields, and complex forcing Su-Fields using an environment (using a substance of environment, its modifications or addition into the environment).



Figure 10. Trend of evolution of complex forcing Su-Field  
**4. The detailed scheme of the Law of Increasing Degree of Su-Field**  
 According to trends introduced before it is possible to compose complete scheme of the Law of Increasing Degree of Su-Field. It is shown on figure 11.

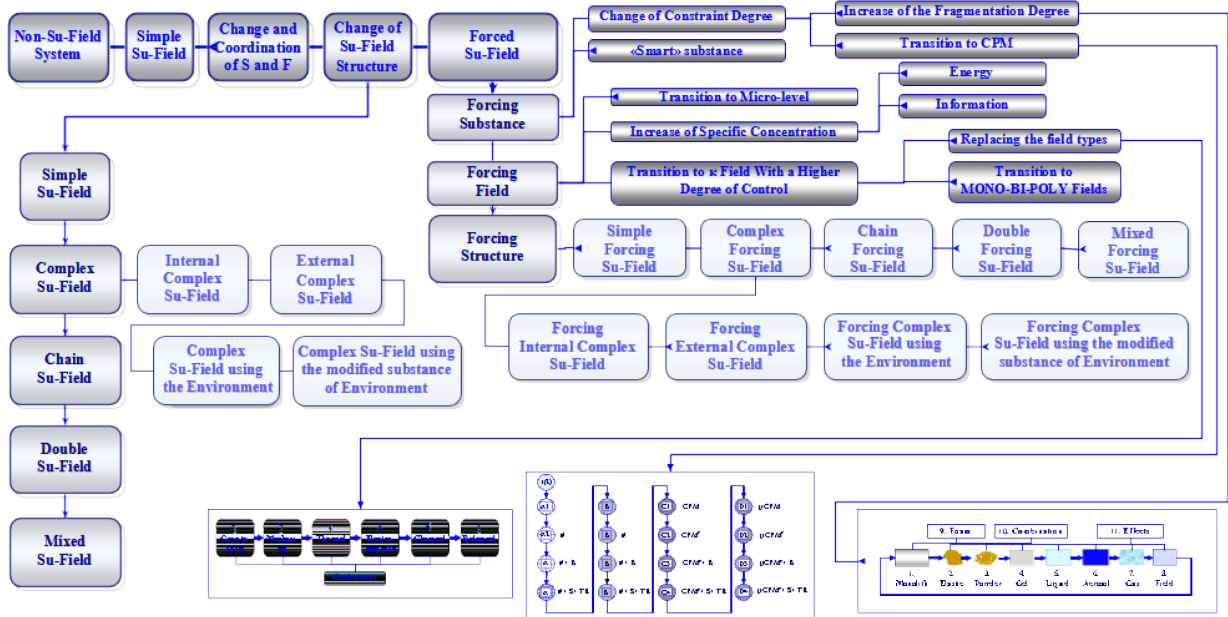


Figure 11. The scheme of The Law of Increasing Degree of Su-Field

## 5. Elimination of harmful interactions

Quite a large class of problems is associated with undesirable effect that acts as **harmful interaction of substance with another substance, field with other field or harmful interaction of fields.**

The elimination of harmful interactions is done with help of definite trends (figures 12 and 13):

- By introduction of third substance  $S_3$ ;
- By introduction of third substance  $S_3$  that is a modification of available substances  $S_1$  and  $S_2$  ( $S_3=S'_1, S'_2$ ) or these substances themselves ( $S_3=S_1, S_2$ );
- By introduction of a field  $F_2$  that affects  $S_1$  or  $S_2$  and changes it into  $S'_1$  or  $S'_2$  that in its turn eliminates harmful interaction between  $S_1$  and  $S_2$ ;
- 'Drawing Off' a harmful action;
- By introduction of second field  $F_2$ ;
- By introduction of third substance  $S_3$  that generates  $F_2$ ;
- By introduction of third substance  $S_3$  that generates  $F_2$  under the influence of  $F_3$ .

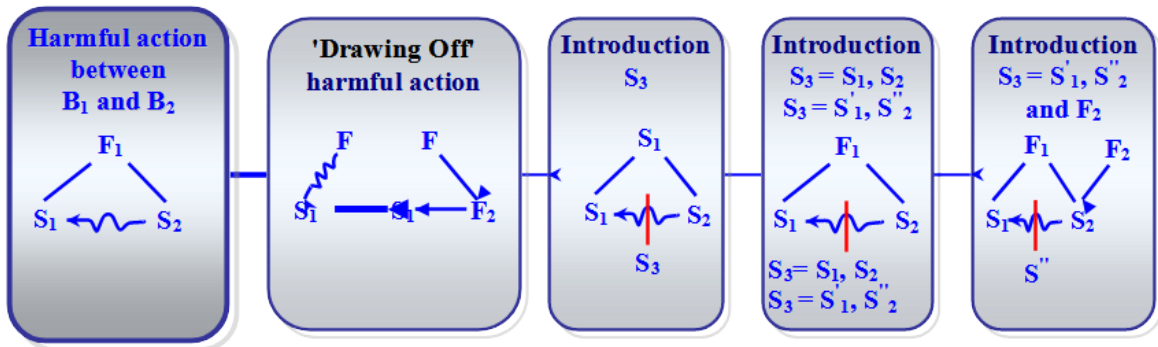


Figure 12. Trend of harmful interaction elimination

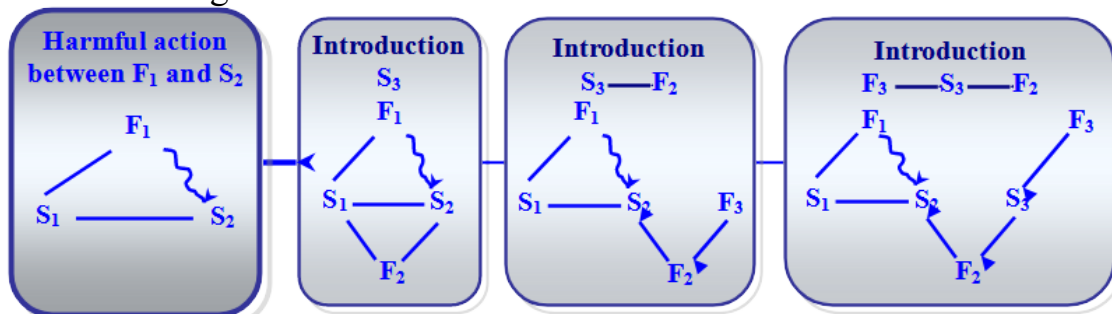


Figure 13. Trend of harmful interaction elimination

## Conclusions

The author introduced changes to the law of increasing degree of Su-Field:

1. Partially changed formulation of the law.
2. Elaborated on general sequence of evolution of Su-Field systems (figure 1)

Introducing:

- Operator of change and coordination of substance and fields in Su-Field.
  - The concept of change of Su-Field structure,
  - The concept of mixed Su-field,
  - Enhanced the concept of forced Su-field
    - As a forced Su-Field the author understands a combination of forced substance, field and structure,
    - The trends of forcing substance and field were elaborated.
3. The means of elimination of harmful interactions were enhanced by constructing two trends: elimination of harmful interactions between substances and between field, and between substance and two fields.
- In the trend of elimination of harmful interactions between substances there was shown an additional possibility of introducing field  $F_2$  that affects  $S_1$  or  $S_2$  changing it into  $S'_1$  or  $S'_2$  by this way it eliminates harmful relationship between  $S_1$  and  $S_2$ ;
  - To the trend of elimination of harmful relationships between field and substance there were added two possibilities:
    - introduction of third substance  $S_3$  that generates field  $F_2$  that compensates for harmful action of  $F_1$ ;
    - Introduction of third substance  $S_3$  that generates field  $F_2$  under the influence of  $F_3$ .

In general the law of increasing degree of Su-Field became more instrumental. It makes possible to solve wider spectrum of problems and predict evolution of technical systems.

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