

# **Parameterized Input Decks in Serpent using Variables and Arithmetic Expressions**

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## Arithmetic expressions and numerical parameters in Serpent

- Serpent input decks become **more flexible** and are **easier to handle** by making use of **variables** and **arithmetic expressions**.
- Using the delimiters < and >, **numerical parameters can be specified** instead of numbers in a Serpent input deck.
- The string between < and > is **interpreted as an arithmetic expression** and may contain previously defined variables and mathematical functions.
- Parameters defined in a Serpent input file are **available in other inputs** recursively read by the `include` statement.
- Implemented by an additional C source file and minimum modification of the Serpent input processor.

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- The following **mathematical functions** are currently available:

<code>sqr(·)</code>	<code>sqrt(·)</code>	<code>sin(·)</code>	<code>cos(·)</code>	<code>tan(·)</code>	<code>ln(·)</code>
<code>lg(·)</code>	<code>exp(·)</code>	<code>abs(·)</code>	<code>sgn(·)</code>	<code>sinh(·)</code>	<code>cosh(·)</code>
<code>tanh(·)</code>	<code>arcsin(·)</code>	<code>arccos(·)</code>	<code>arctan(·)</code>	<code>fak(·)</code>	<code>max(·, ·, ...)</code>
<code>min(·, ·, ...)</code>		<code>int(·)</code>			

- Examples:

```
<x = 2.0>
```

```
<y = 3 * x>
```

```
<y>
```

```
<4 * x>
```

```
<a = cos( pi = 4 * arctan(1) )>    →    pi = 3.1415926...,    a = -1.
```

Serpent input deck (CEFR model)