Report of ...

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1 Introduction

2 Theoretical models and technicalities

2.1 Mathematical model

To solve ordinary differential equation, Euler method is commonly used to achieve $o(h62)$ accuracy as shown in Eq.1:

$$\frac{x_{i+1} + x_{i-1} - 2 * x_i}{h^2} = f''{}_i, \tag{1}$$

where h is the step length, $x(i)$ is the $i^t h$ points and f is the function value at the $i^t h$ point.
This method can be implemented to solve many ODEs involving first and second order derivatives in the following form numerically:

$$\frac{d^2 y}{dx^2} + k^2(x) y = f(x), \tag{2}$$

where k^2 is a real function.
For example, for the Poission's equation under spherical symmetrical field using polar coordinations, the original equation can be simplified as following form:

$$\frac{1}{r^2} \frac{d}{dr} \left(r^2 \frac{d\Phi}{dr} \right) = -4\pi\rho(r), \tag{3}$$

where ϕ is the electrostatic potential, $\rho(r)$ is the local charge distribution and r is the radial distance
If we substitute $\Phi(r) = \phi(r)/r$, we can have

$$\frac{d^2 \phi}{dr^2} = -4\pi r \rho(r). \tag{4}$$

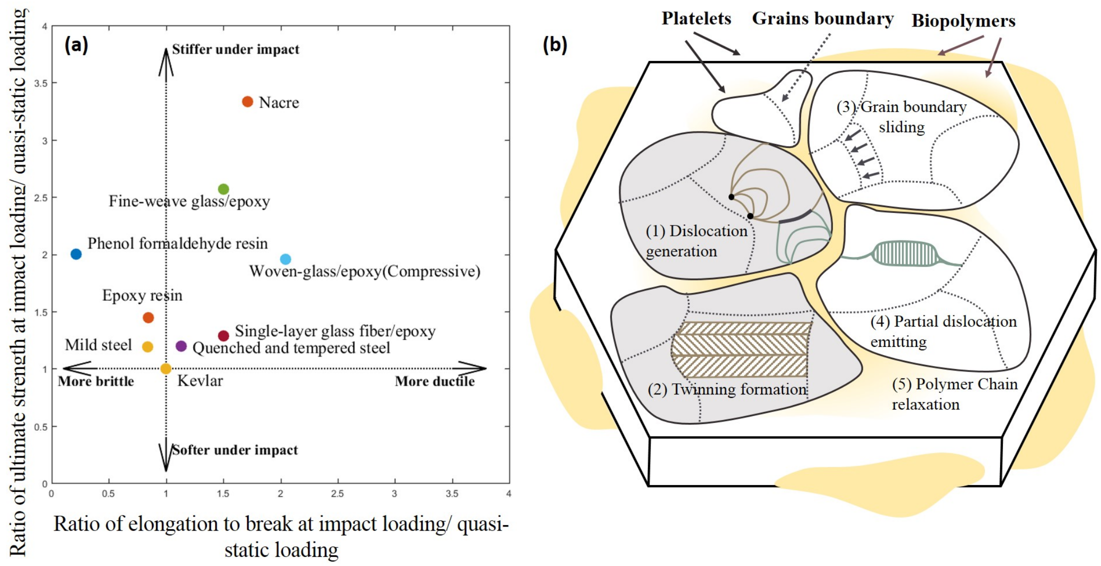

Figure 1:

$\sum_i^k a + b$

$$a + b$$

a	b	c
e	f	g

```
for i in range(1, 5):
print i
else:
print "The for loop is over"
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