

Steepest descent:

St-d( $x_0, f$ ):

$$g_0 = \nabla f(x_0);$$

$$d_0 = -g_0;$$

$$\alpha_0 = \text{ARMISO}(x_0);$$

$$l = 0$$

While  $g_l \neq 0$ :

$$x_{l+1} = x_l + \alpha_l d_l;$$

$$g_{l+1} = \nabla f(x_{l+1});$$

$$d_{l+1} = -g_{l+1};$$

$$\alpha_{l+1} = \text{ARMISO}(x_{l+1});$$

$$l = l+1$$

end

ARMISTO'S RULE:

ARMISTO ( $x_e, f$ ):

$\bar{\alpha} =$   
 $\bar{\beta} =$   
 $\sigma =$

} constant

$m = 1$

While  $f(x_e + \bar{\alpha} \bar{\beta}^m d_e) \geq f(x_e) + \sigma \bar{\alpha} \bar{\beta}^m g_e^T d_e$  :

$m = m + 1$ ;

end

Return  $\bar{\alpha} \bar{\beta}^m$