

$$0 = (\Phi^2 u) - (\Phi' \Phi) (\Phi^2 u) + (1 - \frac{1}{2} (\Phi' \Phi)) u$$

$$(2) - (\Phi' \Phi) \times (1)$$

$$0 = \cancel{(\Phi' \Phi)} u + (\Phi' \Phi) u + (\Phi' \Phi) u \leq 0 = (\Phi' \Phi) u$$

$$(1) \quad 0 = (\Phi' \Phi) u + u + (\Phi' \Phi) u \leq 0 = (\Phi' \Phi) u$$

$$\frac{\sqrt{(u, u)} - (u, u)}{(x, x) - (u, x) \Phi' \Phi (x)} =$$

$$\frac{\sqrt{(u, u)} - 2(u, \Phi' u) + (u, \Phi' u)}{(x, x) - (u, x) \Phi' \Phi (x)} = \frac{\sqrt{(\Phi' u, \Phi' u)}}{(x, x) \Phi' \Phi (x)} = \Phi' \Phi (x)$$

$$\Phi' \Phi (x) = u(x) - (u(x) \Phi' \Phi (x)) \Phi' \Phi (x)$$

$$u(x) \Phi' \Phi (x) = \frac{(x, x) \Phi' \Phi (x)}{(x, x) \Phi' \Phi (x)} - u(x)$$

$$0 = (x, x) \Phi' \Phi (x) + u(x) \Phi' \Phi (x)$$

$$0 = (u(x) + x) \Phi' \Phi (x)$$

$$0 = (\Phi' u) \leq (x, x) \Phi' \Phi (x) \text{ orthogonal to } (u, \Phi' u)$$

$$\sqrt{(\Phi' u, \Phi' u)}$$

(4)

$$(x, x) \Phi' \Phi (x) = (x, x) \Phi' \Phi (x)$$