$$q(x,y) = \frac{~~~~(x-y)^2(x-y)~~~~}{1 - x^T C y + u(x^T K u y)}$$

Then q is a kernel.

___

If q a kernel then

$$k(x,y) = q(x-y, x-y)$$

$$\sum c_i k(x_i, x_j) c_j$$

$$= \sum c_i q(x_i - x_j, x_i - x_j) c_j$$

$$\boxed{q~~(x-y)^T C(x-y)}$$
$$\|$$
$$= \quad x^T C x - 2 x^T C y + y^T C y.$$