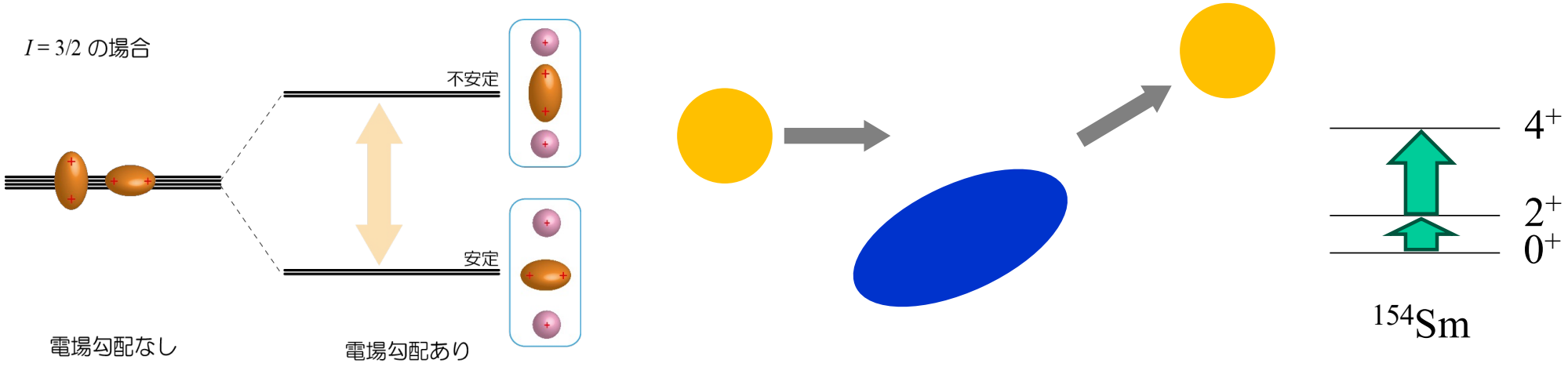
Discussions

One can measure nuclear shapes in various ways:

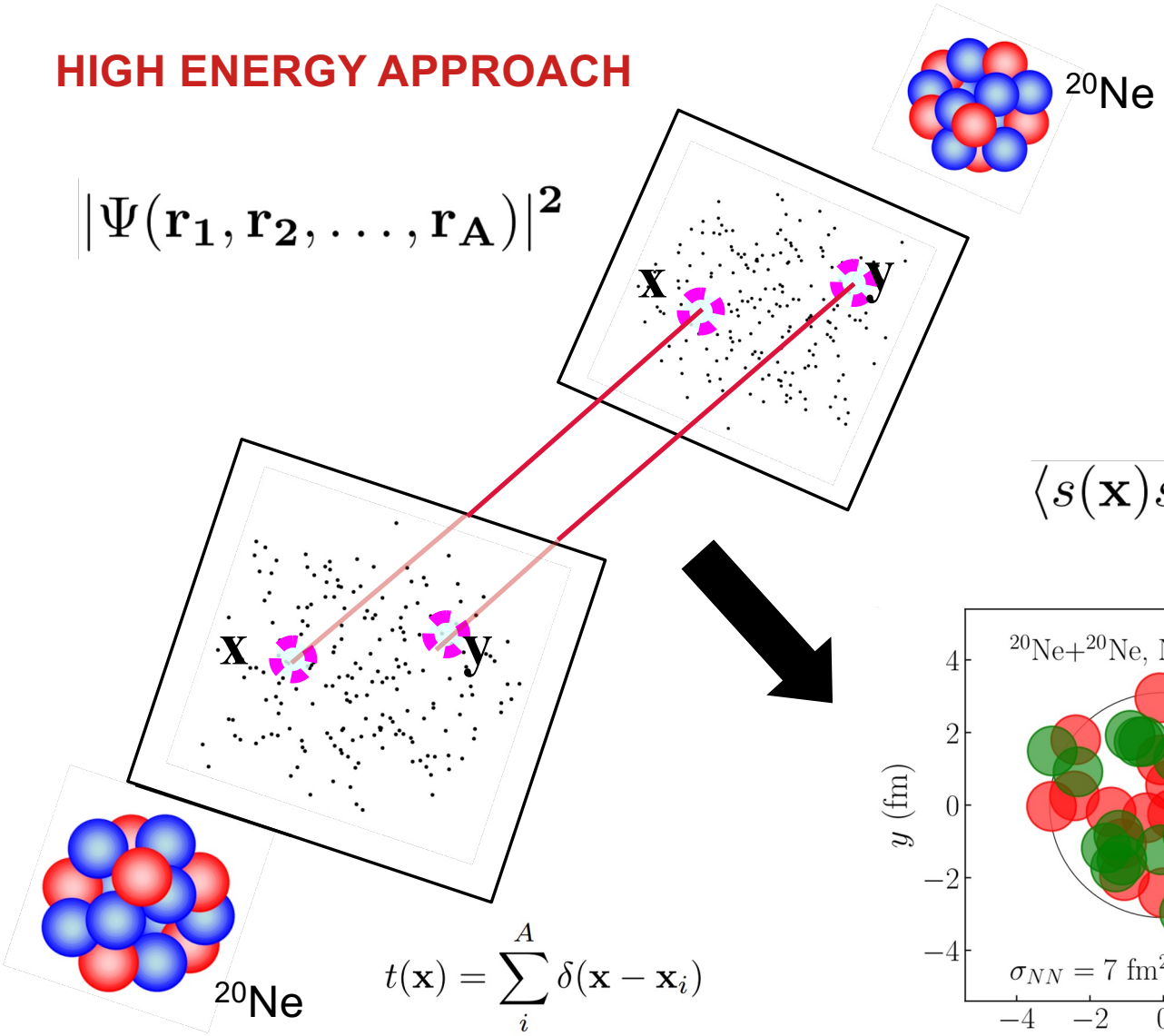
- ✓ quadrupole moment
- ✓ electromagnetic transition
- ✓ nuclear reactions (multiple Coulomb excitations and sub-barrier fusion reactions)



What is an advantage/a justification of using relativistic heavy-ion collisions to probe nuclear shapes? → What is the component beyond "just for fun"?

HIGH ENERGY APPROACH

$$|\Psi(\mathbf{r_1}, \mathbf{r_2}, \ldots, \mathbf{r_A})|^2$$



$$t(\mathbf{x}) = \sum_i^A \delta(\mathbf{x} - \mathbf{x}_i)$$

Ultra-central collisions (all nucleons involved)

Large-scale structures from incoming nuclei !

$$\langle s(\mathbf{x}) s(\mathbf{y}) \rangle \qquad |\mathbf{x} - \mathbf{y}| > 1/\Lambda_{\text{GeV}}$$