Determination of the nuclear radius from total reaction and fusion cross sections of exotic and weakly bound nuclei.

At high energies the nuclear radius can be inferred from the total reaction cross section using the geometric relation $\sigma=\pi R_I^2$, where R_I is sum of the projectile and target radii. At low energies, the total reaction cross sections are related to the Coulomb barrier radius, which in general is larger than the matter distribution radius, due to the long range Coulomb interactions. Here we present an empirical formula that provides a relation between the matter distribution and the Coulomb radii. This formula is derived supposing that the real part of bare the nuclear potential in the surface region is of a double folding type, and can be described by a Woods-Saxon equivalent shape, whose parameters have been determined. Applications to 9Be+9Be and 6He+9Be scatterings will be presented.

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