

anced by a neutron rather than by a proton [see PHYSICS TODAY, July 2008, page 15]. Several observed properties of the dynamics of high-momentum nucleons in nuclear medium surprisingly resemble the properties deduced from the short-range two-nucleon interaction.^{1,3}

Further investigations of nuclear phenomena sensitive to the SRC are planned at Jefferson Lab, both at 6 GeV and after the 12-GeV upgrade, a high-priority item in the long-range nuclear physics plan of the US Nuclear Science Advisory Committee.⁴ Those studies represent one of the best opportunities for exploring the drops of high-density cold nuclear matter and for understanding quark-gluon degrees of freedom in the short-range nuclear forces.

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Dean replies: I certainly agree that short-range correlations play a role in the interpretation of nuclear forces. In particular, present and future experiments at the Thomas Jefferson National Accelerator Facility will shed further light on those interesting phenomena. How the high-energy correlations affect nuclear structure and low-energy excitations remains an interesting problem in its own right.

I note three points. First, unlike the density, the momentum distribution within a nucleus is not observable due to ambiguities that arise through possible field redefinitions in effective field

theory.¹ Second, the central repulsion of the Argonne V18 potential reaches more than 3 GeV.² Augmenting AV18 with a three-body force reproduces nuclear structure information through carbon-12 and, as Leonid Frankfurt and coauthors point out, appears to reproduce short-range correlation expectations. Third, using coupled-cluster theory, we recently calculated medium-mass nuclei through ⁴⁰Ca, ⁴⁸Ca, and ⁴⁸Ni using another of the highly accurate two-nucleon potentials,³ but without including a three-body force. To obtain reasonably converged ground-state properties for those nuclei, the calculations require basis states covering an energy range of at least 450 MeV. We look forward to using ab initio calculations to study the short-range correlations induced by realistic nuclear potentials in medium-mass nuclei.

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SERS assertions addressed

The feature article "Surface-Enhanced Raman Scattering" by Katrin Kneipp (PHYSICS TODAY, November 2007, page 40) presents views and results that are largely outdated; some are no longer generally accepted by the SERS research community, and some have been proven wrong. We counter Kneipp's opinion by focusing on two important aspects of the article: the magnitude of the SERS enhancement factor and the proof of single-molecule sensitivity.

Some of Kneipp's claims are based on interpretations that are more than 10 years old. For example, the claim of the "remarkable 14-order-of-magnitude signal enhancement" is now known to be an overestimation of the actual enhancement factors achievable in SERS and necessary for single-molecule detection.¹ The origin of Kneipp's claim can be traced back to the improper normalization of SERS signals: The SERS intensity of a preresonant molecule (crystal violet) was compared with the non-SERS intensity of a nonresonant molecule (methanol), an error that

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