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Geometric shapes describing nuclear reaction mechanisms such as fusion, alpha emission and capture, binary and ternary fission, planar fragmentation and n-alpha nuclei

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\documentclass[aps]{revtex4}
\usepackage{graphicx}
\textwidth150mm
\textheight220mm
\oddsidemargin10mm
\evensidemargin10mm
\topmargin-10mm
\begin{document}

\title
{\bf Geometric shapes describing nuclear reaction mechanisms such as fusion, alpha emission and capture, binary and ternary fission, planar fragmentation and n-alpha nuclei}

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\maketitle
%*** USE \\ TO END A PARAGRAPH

\noindent
To describe macroscopically nuclear reaction mechanisms such as fusion [1], alpha emission and capture [2], binary and ternary fission [3], planar fragmentation [4] and n-alpha nuclei [5] it is necessary to simulate the distributions of matter or charge by geometric shapes and to know their main macroscopic characteristics such as volume, surface, curvature, center of inertia, moments of inertia, quadrupole moment, ...\\
The purpose of this presentation is to provide such geometric shape sequences and to give their main mathematical properties in order to determine the energy and the dynamics of the reactions. After recalling general definitions, the following shapes will be successively investigated: ellipsoids, symmetric and asymmetric elliptic and hyperbolic lemniscatoids, prolate symmetric and asymmetric compact ternary shapes, toroids and bubbles [6,7].\\
Other planar and three-dimensional multibody shapes such as linear chain, triangle, square, tetrahedron, pentagon, trigonal bipyramid, square pyramid, hexagon, octahedron, octagon and cube used to describe some light nuclei as alpha molecules will be also shown as the associated potentials [5].

\begin{figure}[h]
\includegraphics[width=0.2\textwidth]{lemEllAsym8uniOK.eps}
\includegraphics[width=0.23\textwidth]{lemHypSym8uni.eps}
\includegraphics[width=0.23\textwidth]{TernAsym6noir.eps}
\includegraphics[width=0.2\textwidth]{tore05.eps}
\includegraphics[width=1.01\textwidth]{allshapes.eps}
\end{figure}

\vspace{0.5cm}
\noindent
[1] G. Royer and B. Remaud, Nucl. Phys. A 444, 477 (1985).\\
\noindent
[2] G. Royer, J. Phys. G: Nucl. Part. Phys. 26, 1149 (2000).\\
\noindent
[3] G. Royer, M. Jaffr\'e, and D. Moreau, Phys. Rev. C 86, 044326 (2012).\\
\noindent
[4] C. Fauchard and G. Royer, Nucl. Phys. A 598, 125 (1996).\\
\noindent

[5] G. Royer, G. Ramasamy, and P. Eudes, Phys. Rev. C 92, 054308 (2015).\\
\noindent
[6] G. Royer, N. Mokus, and J. Jahan, Phys. Rev. C 95, 054610 (2017).\\
\noindent
[7] R. W. Hasse and W. D. Myers, 1988, Geometrical Relationships of Macroscopic Nuclear Physics, (Springer verlag, Berlin, 1988).\\
\noindent
\end{document}

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