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Explosive kilonovae and nucleosynthesis in exotic quark models

Tuesday, 20 June 2017 19:30 (2 hours)

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\long\def\TITLE#1{{\Large{\bf#1}}}\long\def\AUTHORS#1{ #1\\[3mm]}
\long\def\AFFILIATION#1#2{[1] #2\\}
\begin{document}
{\small \it Nuclear Physics in Astrophysics 8, NPA8: 18-23 June 2017, Catania, Italy}

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\begin{center}
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\TITLE{ Explosive kilonovae and nucleosynthesis in exotic quark models}\\[3mm]
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%%% Authors and affiliations are next. The presenter should be
%%% underlined as shown below.
%%%
\AUTHORS{{\underline J.E. Horvath[1]}, L. Paulucci[1],
O.G. Benvenuto[3], $4andH.Viturro^4$ }

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{\small \it
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% Enter contact e-mail address here.

\centerline{Contact email: {\it foton@iag.usp.br}}

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The nature of stongly interacting matter inside compact stars could
be an exotic form of a quark-gluon plasma termad strange quark matter".
After 30 years of work the search for signatures of this hypothesis continues.
One interesting possibility is the detection of chunks of SQM in cosmic
rays (strangelets). In spite of a few candidate events (i.e. Centauros), their presence
among primeries is not confirmed. The latest experiments in fact exclude
a large flux predicted earlier.
One of the main sources of strangelets is expected to be the merger of SS.
We present calculations on the expected nucleosynthesis spectra for the strange star-strange
star merger scenario as means to test the strange quark matter hypothesis and its
realization inside such objects. We find that most of strangelets decay into ordinary
hadrons due to finite temperature effects. However, the n/p ratio of the ejected
matter is very large. This is very different from the typical r-process
nucleosynthesis expected in neutron star mergers and the mass buildup would
proceed in a dense Big-Bang nucleosynthesis-like fashion. The neutron-to-proton ratio would allow to reach
the iron peak only, a very different prediction from the standard scenario. The resultant light curve is compared
favorably with the existingkilonova" data.
\bigskip
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\noindent
[1] L. Paulucci et al. submitted to Physical ReviewLetters (2017).}
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