

Abstract Submitted  
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**Is there an upturn phenomenon in the strength of metals at strain rates of  $10^3$ - $10^4$  s $^{-1}$ ?** YECHESKEL ASHUACH, ZVI ROSENBERG, ROMAN KOSITSKI, ALON MALKA-MARKOVITZ, Rafael Advanced Defense Systems, Ltd. — In this paper we focus on the controversy surrounding a claim, made by many authors, that the flow stresses of various materials experience a very large increase (the "upturn" phenomenon) at strain rates in the range of  $10^3$ - $10^4$  s $^{-1}$ . This claim was contradicted by other workers who did not find such "upturn" behavior for the same materials. We identify some possible reasons for this controversy, focusing on the differences between the dynamic loading techniques, which were used in these studies. Our conclusion is that these differences may result in problems with data interpretation, which can lead to the controversies surrounding the "upturn phenomenon". In order to enhance our claim we performed Kolsky compression bar tests on two materials for which an upturn was found in previous works, namely, copper and a tungsten heavy alloy. We found no upturn in these materials at strain rates of  $10^3$ - $10^4$  s $^{-1}$  which covers range in which the upturn was found in those works.

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