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On the Existence of Shock Instabilities at Hugoniot Pressures Beyond the Minimum Volume OLIVIER HEUZE, JEAN-CHRISTOPHE PAIN, GWENAËL SALIN, CEA/DAM/DIF — Flow instabilities are among the main issues of ICF studies. Heterogeneities of material or geometry are sources of instabilities which are strongly amplified in spherical geometries. According to the theory of Dyakov, some ranges of the Equation of State (EOS) also generate or amplify instabilities in shock waves, which can be considered among the origins of Richtmyer- Meshkov instabilities [Bates, 2004]. Stability corresponds to Dyakov parameter $-1 < h < 1$. The values $h < -1$ can be associated to phase transition or dissociation in gases and has been widely studied. But instabilities corresponding to $h > 1$, associated to a positive P-V slope on the Hugoniot curve beyond the minimum volume, occurring with ionization, remains unstudied as well theoretically as experimentally. We know that, on the Hugoniot curve, the volume decreases versus pressure down to a minimum and then increases with the successive levels of ionization towards asymptotic values for the volume. Recent EOS results obtained by Pain (2007) in this range of pressure about all the elements allow us to investigate now the stability conditions for $h > 1$. The first question to raise is the possibility of existence of such instabilities. In the present study, we focus on the properties of several elements (aluminium, iron, copper...) in this range of pressure to try to give a first answer to this question.

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