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Spring 5-14-2012

# First principles investigation on chemical bonding of transition metal borides and carbides

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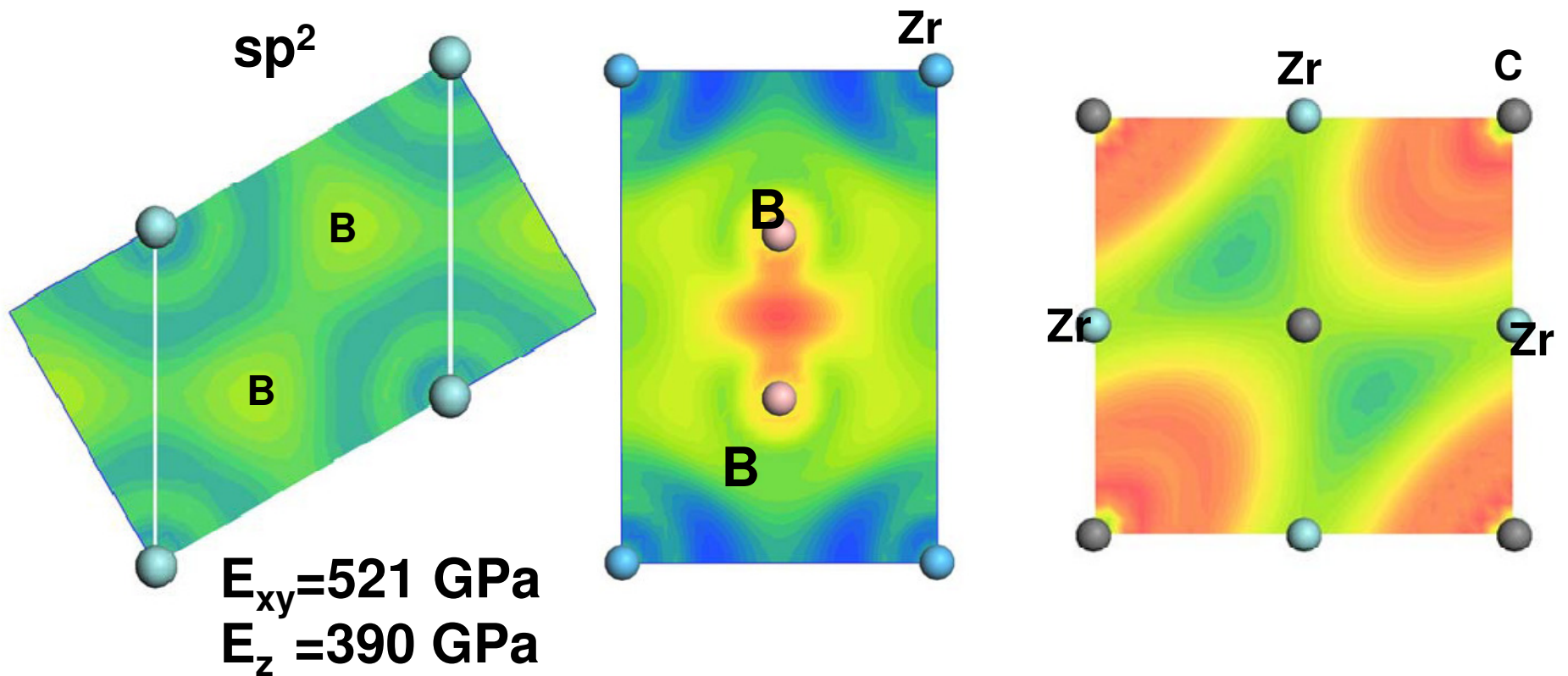
Junshan Wang and Yanchun Zhou, "First principles investigation on chemical bonding of transition metal borides and carbides" in "Ultra-High Temperature Ceramics: Materials For Extreme Environmental Applications II", W. Fahrenholtz, Missouri Univ. of Science & Technology; W. Lee, Imperial College London; E.J. Wuchina, Naval Service Warfare Center; Y. Zhou, Aerospace Research Institute Eds, ECI Symposium Series, (2013). <http://dc.engconfintl.org/uhtc/23>

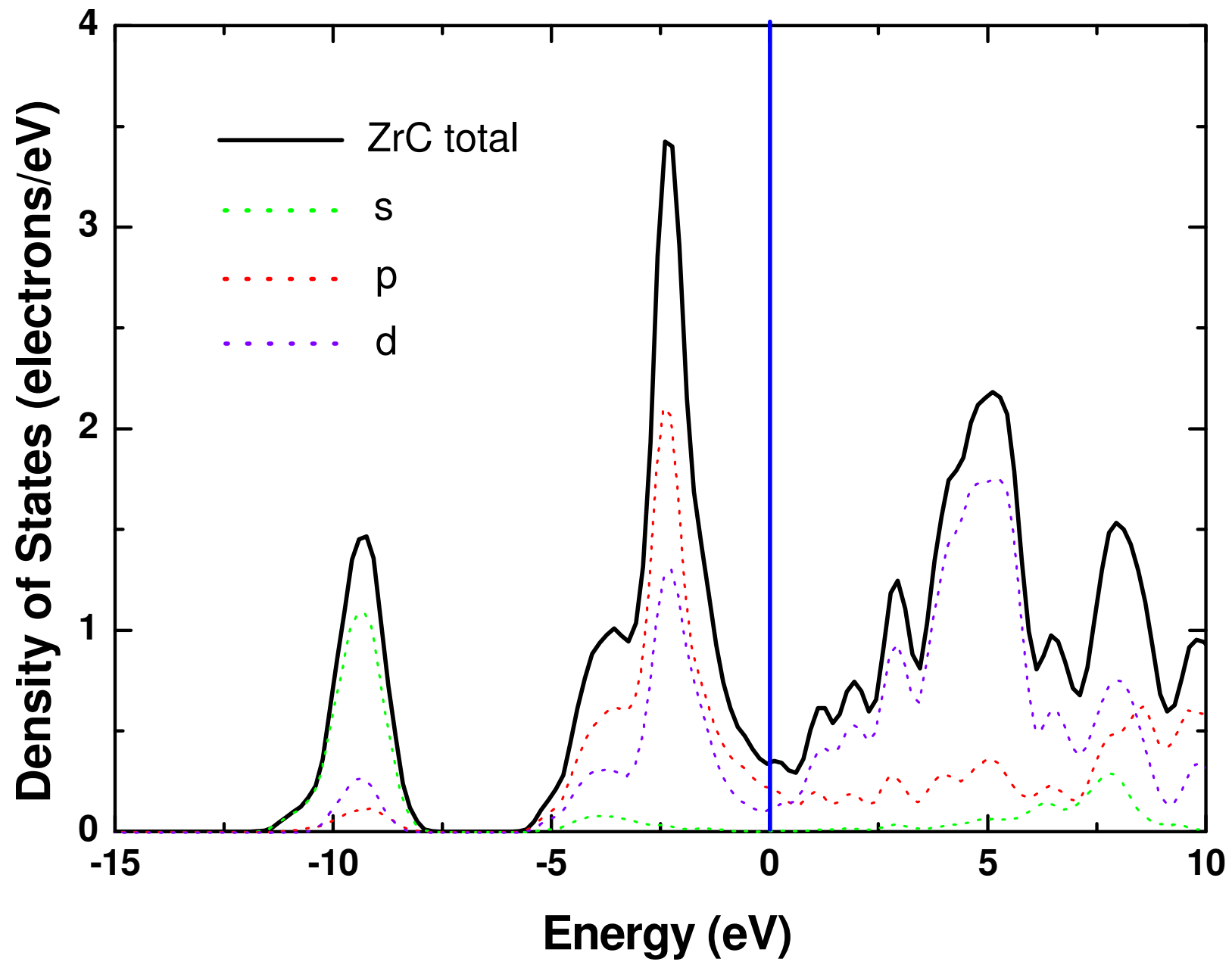
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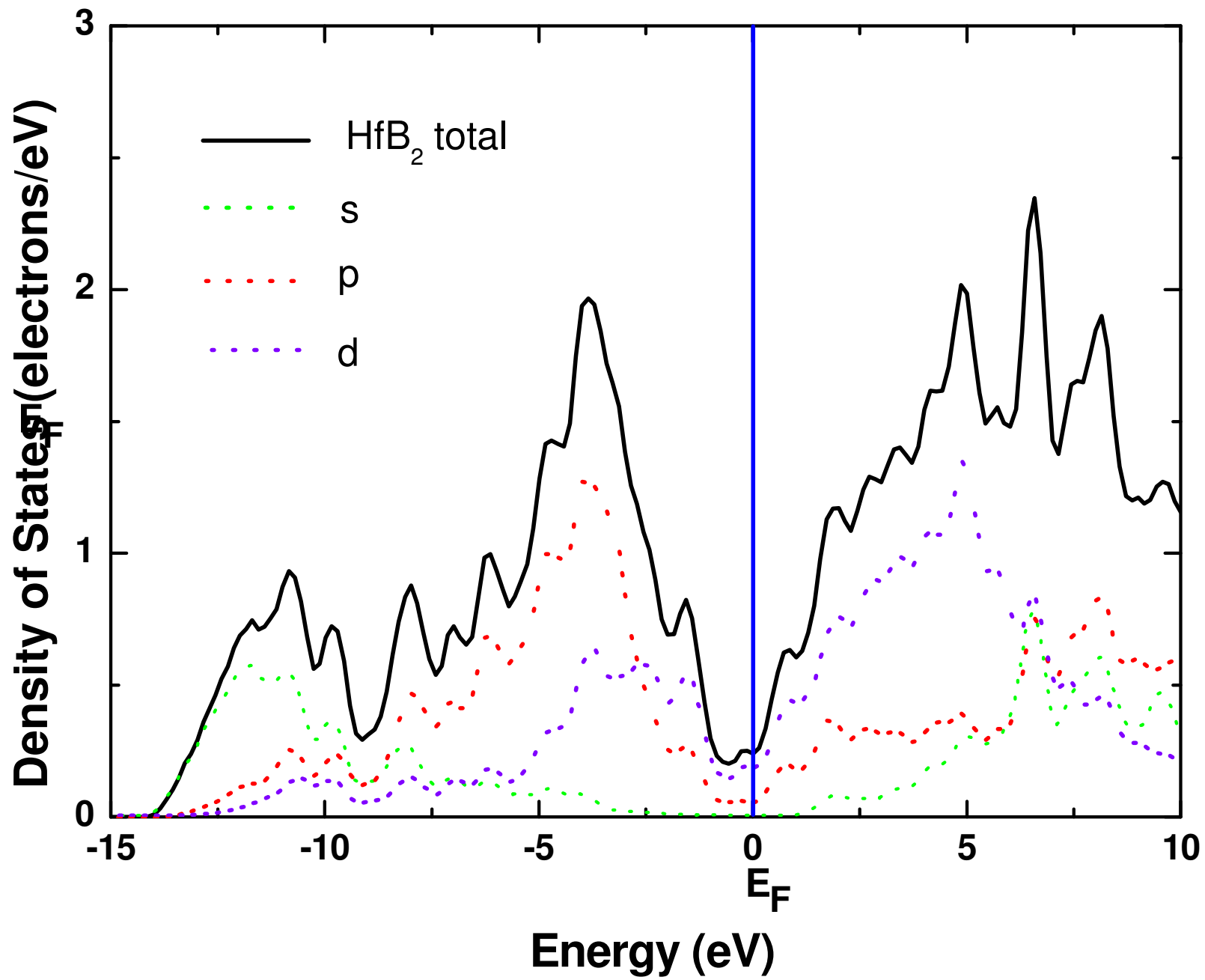
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## Elastic properties of transition metal carbides and borides

	$E_x$ (GPa)	$E_y$ (GPa)	$E_z$ (GPa)	$E$ (GPa)	$B$ (GPa)	$G$ (GPa)	$G/E$
ZrC	410.52	410.52	410.52	407	221.59	161.89	0.72
ZrB <sub>2</sub>	521.10	521.10	390.43	523	238.31	230.98	0.96
HfB <sub>2</sub>	537.51	537.51	403.73	542	261.35	232.71	0.89
NbB <sub>2</sub>	522.86	522.86	387.75	525	288.87	219.79	0.76
TaB <sub>2</sub>	486.25	486.25	354.00	480	299.63	169.74	0.56

