地球物理学报 » 2009, Vol. 52 » Issue (8) :2128-2134 doi:10.3969/j.issn.0001-5733.2009.08.022
勘探地球物理

引用本文(Citation):
刘福平,王安玲,李瑞忠,陈辉国,杨长春.全反射SH地震波的Goos-Hänchen效应动校正时差
. 地球物理学报, 2009,52(8): 2128-2134,doi: 10.3969/j.issn.0001-5733.2009.08.022

LIU Fu-Ping;WANG An-Ling;LI Rui-Zhong;CHEN Hui-Guo;YANG Chang-Chun.The influence on normal moveout of total reflected SH-wave by Goos-Hänchen effect at an interface of strata
.Chinese J.Geophys. (in Chinese),2009,52(8): 2128-2134,doi: 10.3969/j.issn.0001-5733.2009.08.022

全反射SH地震波的Goos-Hänchen效应动校正时差

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The influence on normal moveout of total reflected SH-wave by Goos-Hänchen effect at an interface of strata

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摘要
利用SH地震波（偏振化方向垂直入射面的横波）在地层界面反射系数的附加相角导出了SH波Goos-Hänchen效应所引起的横向偏移和横向偏移渡越时间，给出了Goos-Hänchen效应正常时差公式，讨论了Goos-Hänchen效应对反射SH波正常时差的影响，绘出了横向偏移、横向偏移渡越时间、Goos-Hänchen效应正常时差及Goos-Hänchen效应正常时差校正量曲线.数值算例表明：对掠入射波或入射角在临界角附近的入射波，SH反射波的横向偏移、横向偏移渡越时间非常大，Goos-Hänchen效应对正常时差会产生较大的测量误差，在其他角度的入射波，横向偏移（横向偏移渡越时间）与波长（周期）为同一个数量级.横向偏移效应对SH反射波的传播走时影响是不可忽略的，因此在实际的地震资料处理中应进行横向偏移效应误差校正.

关键词 Goos-Hä, nchen效应, SH地震波, 横向偏移, 正常时差, 横向偏移渡越时间

Abstract: Using the phase shift of reflection coefficient of SH seismic wave at the interface of strata, we derived the lateral shift and group time delay of total reflected SH seismic wave, given formulae of normal moveout of Goos-Hänchen effect, discussed the influence of Goos-Hänchen effect on normal moveout of SH-wave, and drawn the curves of lateral shift, group time delay, normal moveout of Goos-Hänchen effect and error of normal moveout caused by Goos-Hänchen effect with respect to the angle of incidence. The results show that for glancing wave or angle of incidence being near the critical angle, the lateral shift and group time delay are very large. A large error can be caused by Goos-Hänchen effect; In other angle of incidence the lateral shift(group time delay) is the same order of magnitude as the wavelength (period); So Goos-Hänchen effect can bring about large influence on the travel time of SH-wave. The error correction of Goos-Hänchen effect should be made before seismic data processing.

Keywords COLOR: black, FONT-FAMILY: Verdana, mso-bidi-font-family: 'Times New Roman', mso-font-kerning: 1.0pt, mso-ansi-language: EN-US, mso-fareast-language: ZH-CN, mso-bidi-language: AR-SA, Goos-Hmso-fareast-font-family: 宋体">Goos-HCOLOR: black, FONT-FAMILY: 'Times New Roman', mso-bidi-font-size: 12.0pt, mso-font-kerning: 1.0pt, mso-ansi-language: EN-US, mso-fareast-language: ZH-CN
Received 2008-10-06;

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链接本文:
http://118.145.16.227/geophy/CN/10.3969/j.issn.0001-5733.2009.08.022 或 http://118.145.16.227/geophy/CN/Y2009/V52/I8/2128

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