

on wave equation analysis and those based on parametric analysis.

Wave equation based methods work using a regression approach, using the physics of wave propagation to reconstruct the missing samples. In geophysics, numerous approaches based on this model are proposed [Ronen(1987), Bagaini and Spagnolini(1999), Stolt(2002), Trad(2003), Fomel(2003)]. Wave equation based methods require *a priori* knowledge of velocity model as input.

Parametric analysis based reconstruction methods are based on the *a priori* information from the seismic data alone [Naghizadeh and Sacchi(2009a)]. Most parametric reconstruction methods are based on Fourier transformation from one domain to another [Naghizadeh and Sacchi(2008b), Naghizadeh and Sacchi(2008c), Naghizadeh and Sacchi(2008)]. In the last few years excellent research is been done in this area [Liu and Sacchi(2004), Schonewille et al.(2009)Schonewille, Klaedtke, Vigner, Brittan, and Martin].The Prior assumption is either based on the stationarity of the process or based on the fact that most of the power in the power spectrum is concentrated on the lower frequencies, analysis based on this fact known as bandlimitness [Naghizadeh and Sacchi(2010)]. Bandlimitness enforces only the use of certain set of frequencies [Feichtinger et al.(1995b)Feichtinger, These algorithms perform efficiently even in situations where bandlimited assumption is not satisfied exactly [Trad(2008)].

Seismic data reconstruction is based on data mapping, generally mapping of spatial domain data to the Fourier domain. The most common bases for obtaining high resolution reconstruction techniques are the Fourier transform [Sacchi et al.(1998)Sacchi, Ulrych, Xu et al.(2005)Xu, Zhang, Pham, and Lambare, Liu and Sacchi(2004), Naghizadeh and Sacchi(2007)Naghizadeh and Sacchi(2008a), Naghizadeh and Sacchi(2009b), Naghizadeh and Sacchi(2007a)] and the Radon transform [Darche(1990), Verschuur and Kabir(1995)]. In the parabolic