Fig. 13. $\tilde{b}_{bp}$ as a function of wavelength for the data as indicated. Vertical lines are the SDs for the BOUSSOLE $\tilde{b}_{bp}$ values computed for all [Chl]. The λ^{-1} spectral dependency is shown as a thin solid line.

When a spectral dependence is observed for b_{bp}, the question is whether it can be attributed to b_p or $\tilde{b}_{bp}$ or to both. Again, when Mie theory is supposedly applicable to oceanic particles of low refractive index and distributed following a Jünge-type power law, $\tilde{b}_{bp}$ should be spectrally neutral so the spectral effect is attributed to b_p (Ulloa et al. 1994; Morel and Maritorena 2001). When a weak spectral dependence is found, authors often prefer not to conclude in order not to violate theoretical assumptions (Whitmire et al. 2007). Huot et al. (2008) also concluded that $\tilde{b}_{bp}$ was spectrally flat because they found a similar spectral dependence on b_{bp} and b_p over the spectral range of 412–660 nm. When looking more specifically at their data in the spectral range of 443–555 nm, however, b_p actually does not show any spectral dependence (their fig. 5), which would imply that $\tilde{b}_{bp}$ does show such a dependence.

The b_p BOUSSOLE data (not shown) and the b_p PnB AC-9 data (*see* fig. 2 in Kostadinov et al. 2007) rather indicate that b_p is close to neutral, so the b_{bp} spectral dependence would essentially result from a spectral dependence of $\tilde{b}_{bp}$. The $\tilde{b}_{bp}$ spectral values corresponding to the BOUSSOLE data shown in Fig. 7A are displayed in Fig. 13 (gray squares), along with values determined from the volume scattering function meter measurements on the BOUSSOLE site in August 2004 for an average [Chl] of 0.12 mg m^{-3} (open circles). The $\tilde{b}_{bp}$ values are systematically larger in the blue than in the green, and the difference is more pronounced for low chlorophyll concentrations. The BOUSSOLE data used here show spectral slopes ranging from λ^{-1} for high [Chl] to λ^{-3} for low [Chl], which is quite high. The August 2004 MVSM data have a λ^{-1} slope. Low-[Chl] environments are expected to exhibit higher spectral slopes of b_{bp} (Loisel et al. 2006; Kostadinov et al. 2009), so if b_p is assumed to be relatively flat spectrally, these observations are consistent with a relative dominance of smaller particles (higher PSD slopes) in more oligotrophic environments.

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