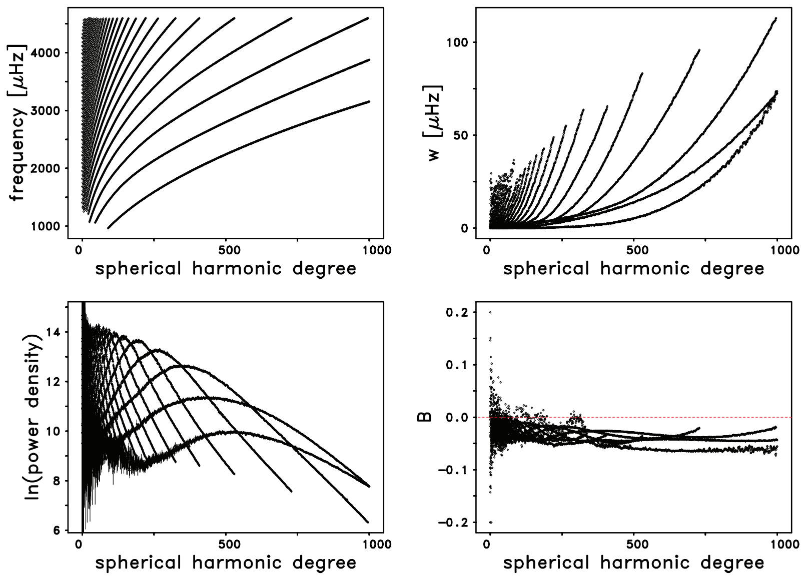

Figure 7. (upper-left) Dispersion plane coverage of the set of frequencies obtained with the MPTS method when applied to the power spectra obtained from the $\mathcal{R}$2010_66 observing run. (upper-right) Degree dependency of the line widths, w. (lower-left) Degree dependency of the amplitudes, or power densities. (lower-right) Degree dependency of the line asymmetries, B. The dashed red line is for $B = 0$.

the WMLTP method includes the option to calculate the m-averaged spectrum of the multiplet (n, l) from the respective zonal, tesseral, and sectoral spectra in a weighted or unweighted fashion within the fitting box of that multiplet, provided suitable frequency splitting coefficients are available. We will make use of this option in the following comparative study.

In order to avoid any confusion, we note that the term "WMLTP" refers to the rev7 version of this method throughout. We will use the term "WMLTP_ac" when we refer to the rev7 version that uses the option to calculate the m-averaged spectra employing frequency splitting coefficients obtained from the MPTS method.

5.2. *Mean-multiplet technique*

In the mean-multiplet technique of Schou (1992) the Fourier transforms of the gapfilled time series of the spherical harmonic coefficients, which result from the spatial decomposition of the individual Dopplergrams in an observing run, are fit using a maximum likelihood approach, taking into account leakage between the modes. Rather than fitting, however, for the individual $2l + 1$ mode frequencies within a multiplet (n, l), it is directly fitted for the mean-multiplet frequency $\nu_{n,l}$ and the frequency

splitting coefficients $a_k^{(n,l)}$, assuming that the line width and the amplitude of the $2l+1$ modes are independent of the azimuthal order m. Initially, it is fit for 6 frequency splitting coefficients, then for 18 and 36 once the 6-term fits have converged. Leaks from multiplets other than (n, l) are taken into account. The asymmetry of the line profiles is taken into account by using an asymmetrical profile that is derived by a generalization of the profile of Nigam & Kosovichev (1998). This way undesirable properties of the profile of Nigam & Kosovichev (1998) are avoided, viz. its invalidity far from the mode frequency and the non-boundedness of its integral over all frequencies (Larson & Schou 2015). The data obtained from the mean-multiplet technique, which we used in our comparisons and which correspond to our data set $\mathcal{R}$2010_66, are given in `jsoc.stanford.edu/SUM3/D665662933/S00000/m10qr.6335`. For the details of their generation we refer to Larson & Schou (2015). In the following we will use the term "JS" when we are referring to the mean-multiplet technique.

5.3. *Fitting methodology of Korzennik*

The fitting methodology of Korzennik et al. (2004) is only applicable to high-degree modes with degrees $l \gtrsim 100$ (p-modes) to 200 (f-modes). Its basic idea consists of correcting for the bias introduced when fitting a ridge of power at high degrees. For this purpose, a sophisticated model of the underlying modes that contribute to the distribution of power in a ridge was developed to generate synthetic ridges, which are then fitted using the same methodology employed to fit the observations. Hence, the results of fitting these synthetic data allow to derive a measure of the bias between the ridge properties and those of the underlying targeted mode used in the modeling. By means of this measure the results from fitting an observed ridge can be corrected to derive the un-biased properties of the underlying targeted mode. The data obtained from the fitting methodology of Korzennik, which we used in our comparisons and which correspond to our data set $\mathcal{R}$2010_66, are located in `www.cfa.harvard.edu/~sylvain/research/tables/HiL/MDI/2010/`. For the details of their generation we refer to Korzennik et al. (2013). In the following we will use the term "SK" when we are referring to the fitting methodology of Korzennik.

5.4. *Results from comparative study*

Insert here the description of Figure 8.

The two middle-row panels of Figure 8 show that the MPTS method produces widths that agree more closely for the lower degrees with the widths from Jesper's method than the WMLTP method produces.

Insert here the description of Table 5.

1) The differences MPTS - WMLTP_ac show the effect of m-averaging.

2) The differences WMLTP_ac - WMLTP show the effect of using different sets of splitting coefficients for the generation of the m-averaged spectra.