Finally, in general, from expression (10) for $T \neq 0$, the peak angular frequency and half-bandwidth are given by

$$f_p = R f_0 \qquad (13)$$

and

$$h' = \sqrt{R}\, h \qquad (14)$$

$$\text{where } R = \frac{1}{\sqrt{1+4\pi^2T^2h^2}} \qquad (15)$$

is the reduction factor which quantifies the extent to which the frequency of the signal is degraded in the stack due to random static errors.

The reduction factor R for frequency and $\sqrt{R}$ for the half bandwidth are displayed in figure 1as a function of a dimensionless parameter T.h. it is seen, for example, that for RMS static error of 2 milli sec. and a signal of half-bandwidth of 40 Hz., the frequency degradation factor is 0.798, i.e. the stacking process would degrade the peak frequency of a signal from , say, 50 Hz to 40 Hz and half bandwidth from 40 Hz to 35 Hz. As the product (T.h) increases, the reduction factor decreases becoming as low as 0.387 for (T.h) = 0.2 corresponding to, say, T=5 milli sec. and h=40 Hz. Thus high bandwidth of the source signal is meaningful only to the extent that static errors can be controlled and corrected accurately.

These formulae can help a processor in analyzing the degradtion of frequency due to static errors during processing of data. If the reduction factor R as computed from (15) does not account adequately for frequency degradation as seen in the final stack vis-a-vis the frequency content of the input data, then the processor would need to examine design processes such as mute, velocity field, NMO stretch, aliasing in DMO, and other multi-channel processes like migration, spatial filters etc.

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