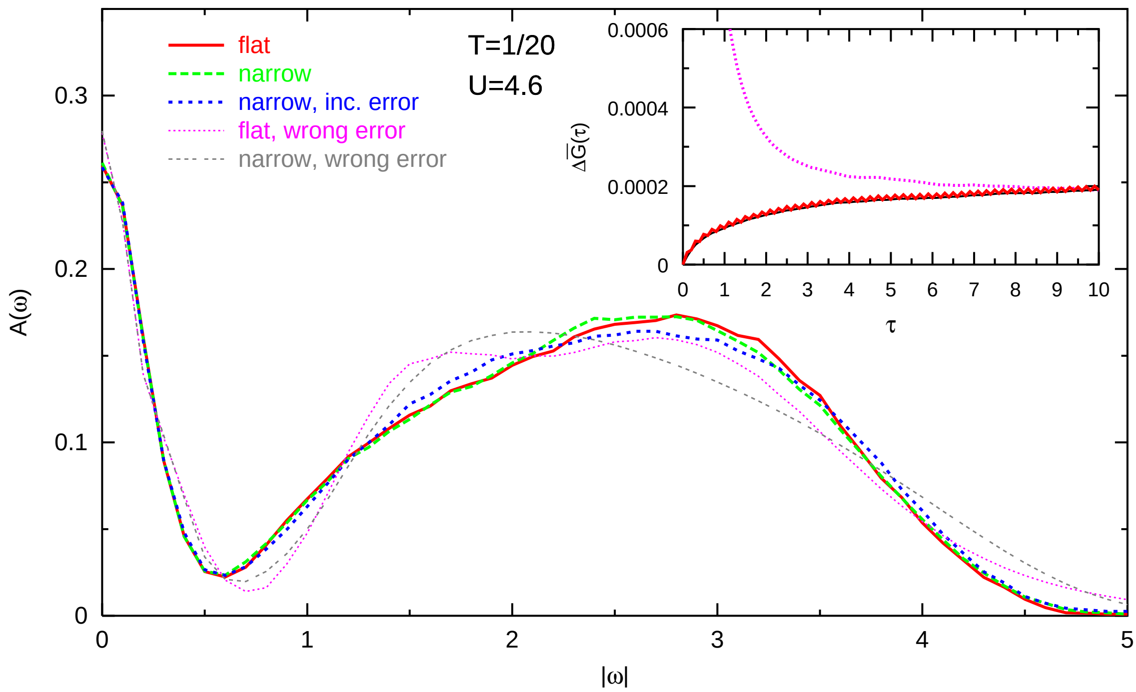

Figure 3.72: Local spectral function $A(\omega)$ for $T = 1/20$ and $U = 4.6$: MEM results obtained using the Sandvik scheme based on statistical errors of spin-averaged QMC measurements (thick lines) or wrongly exaggerated errors (thin lines). Solid and dotted lines correspond to a flat default model; dashed lines correspond to a narrow default model (cf. Fig. 3.71). Inset: errors estimated from spin-averaged measurements (lower lines) and exaggerated error (dotted line).

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spin species as independent implies the error estimate shown as a dotted line which increases rapidly for $\tau \longrightarrow 0$ (and extends to about 0.004 at $\tau = 0$). The zig-zag curve also shown in the inset of Fig. 3.72 takes additional systematic errors into account as we will discuss below. The overestimation of errors at small τ implies that this region is essentially disregarded in the MEM continuation which suppresses the most important information: on the one hand, higher-order moments of the spectrum are directly associated with derivatives $G^{(n)}(\tau)|_{\tau=0}$ via (1.59); on the other hand, the assumption of Gaussian error distribution is very accurate in this region.[65] These considerations are clearly supported by the MEM results obtained using the Sandvik algorithm shown in the main part of Fig. 3.72. Here, the solid and long-dashed lines correspond to calculations based on the adjusted error (red solid line in the inset) for the flat and the narrow default model detailed in Fig. 3.71, respectively. The excellent agreement between both results supports the good quality of the QMC data; the

[65] In fact, Jarrell recently suggested that QMC estimates of $G(\tau)$ should be disregarded in the problematic region of $\tau \approx \beta/2$ in gapped phases in order to avoid negative impact of non-Gaussian error statistics on the MEM results. In the symmetric case at hand, this suggestion would amount to using **only** QMC data at small τ (which is essentially disregarded in the scheme conventionally employed in our group).