	$a = 0.5$		$a = 0.9$		$a = 0.98$	
D	t^*_D	$\sum_{n=1}^{D} t^{*\,2}_n$	t^*_D	$\sum_{n=1}^{D} t^{*\,2}_n$	t^*_D	$\sum_{n=1}^{D} t^{*\,2}_n$
0	-0.26795	0.000000	-0.62679	0.000000	-0.81735	0.000000
1	0.98364	0.967540	0.96671	0.934524	0.95139	0.905141
2	0.08255	0.974354	0.19413	0.972212	0.25457	0.969945
3	-0.15137	0.997267	-0.14143	0.992213	-0.13252	0.987505
4	-0.03143	0.998255	-0.07444	0.997755	-0.09835	0.997177
5	0.03775	0.999680	0.03236	0.998802	0.02759	0.997938
6	0.01273	0.999842	0.03046	0.999730	0.04063	0.999589
7	-0.01062	0.999955	-0.00776	0.999790	-0.00528	0.999617
8	-0.00534	0.999983	-0.01294	0.999957	-0.01748	0.999923
9	0.00310	0.999993	0.00160	0.999960	0.00032	0.999923
10	0.00229	0.999998	0.00566	0.999992	0.00777	0.999983
11	-0.00091	0.999999	-0.00012	0.999992	0.00053	0.999983
12	-0.00101	1.000000	-0.00253	0.999998	-0.00355	0.999996
13	0.00024	1.000000	-0.00018	0.999998	-0.00050	0.999996
14	0.00045	1.000000	0.00116	1.000000	0.00167	0.999999
15	-0.00006	1.000000	0.00016	1.000000	0.00032	0.999999

Table 2.2: *Leading hopping matrix elements corresponding to the generalized asymmetric model DOS (2.27) with parameter a (cf. Table 2.1). The columns which consist of partial sums indicate rapid convergence of the corresponding dispersion and DOS: only a fraction $1 - \sum_{n=1}^{D} t^{*\,2}_n$ of the variance arises from hopping terms beyond D^{th} neighbors. The "hopping" term with range $D = 0$ denotes an on-site energy, i.e., the first moment of the energy distribution.*

corresponds to a Bethe lattice with only NNN hopping, as we have shown in Sec. 2.2. We would have to overcome numerical stability issues just to reproduce a square-root singularity at the lower band edge which we regard as an artifact of $d = \infty$ (in complete analogy to the situation for the fcc lattice).

Earlier attempts to link the asymmetric model DOS (2.27) to some microscopic tight-binding model (Wahle et al., 1998; Kollar, 1998) have led to a related, but quite different construction scheme, which can be applied in low and infinite dimensions (Kollar, 2002). The straightforward application in $d = 1$ to the DOS (2.27) with $a = 0.98$ yields scaled hopping matrix elements which are well approximated by $t^*_{2n+1} = 0.67\,(2n)^{-1.6}$, $t^*_{2n} = -0.54\,(2n)^{-1.6}$ for small hopping range and decay as $t_D \sim D^{-5/3}$ for large range (Kollar, 1998). When generalized to higher dimensions, Kollar's construction is based on a dispersion $\epsilon(\boldsymbol{k}) = g(|k|)$ (for some function g) which is spherical except at the boundaries of the Brillouin zone. We regard it more as a proof of existence of a dispersion for a given DOS in arbitrary dimension than as a workable scheme for the following reasons: Most importantly, the above spherical form for the dispersion implies discontinuities in the Fermi velocity at the boundaries of the Brillouin zone for $d > 1$ which, if taken seriously, makes the computation of