Figure 4-24  The solid lines are isotherms, $T - T_s$ ($^\circ$K), in the oceanic lithosphere from Equation (4-125). The data points are the thicknesses of the oceanic lithosphere in the Pacific determined from studies of Rayleigh wave dispersion data. (From A. R. Leeds, L. Knopoff, and E. G. Kausel, Variations of upper mantle structure under the Pacific Ocean, Science, 186, 141–143, 1974.)
Observed Data (raw and binned)

Rayleigh Waves at 12mHz; observed data

Averaged in sqrt(age) Age Bins

Fit of a cooling plate (100km thick, basal T=1350°C)

L5 plate 100km/1350°

L16 plate 100km/1350°

R5 plate 100km/1350°

R16 plate 100km/1350°

Love

Rayleigh

5 mHz

15 mHz

0.34: misfit

Figure 4-25  Mean values and standard deviations of ocean floor heat flow measurements as functions of age compared with Equation (4-127). Data from J. G. Sclater, C. Jaupart, and D. Galson, The heat flow through oceanic and continental crust and the heat loss of the Earth, *Reviews of Geophys. and Space Physics*, 18, 269–311, 1980.
heat flow vs age $\implies q(t) = k \frac{\partial T}{\partial z} \implies q(t) \approx 480t^{-1/2}$
Hasterok, 2013

Heat Flow [mW/m²]

sed. thickness ≥ 325 m
seamounts ≥ 85 km

sed. thickness < 325 m
seamounts - no filter

No. observations

unfiltered
filtered, N = 4929

unfiltered
excluded, N = 7370

SD/HF

data points

Age [Ma]

Data/GDH1

Age [Ma]
depth vs age  \[ d(t) = \frac{-\alpha \rho_m}{\rho_m - \rho_w} \int_0^L T \, dz \]  \[ d(t) \approx 2500 + 350t^{1/2} \]

Fig. 1. Plot of mean depth in the North Pacific versus the square root of age. Numbers at the bottom of the figure denote selected Cenozoic and Mesozoic magnetic anomalies [from Parsons and Sclater, 1977].