Let $\Omega = \mathbb{R}^n_+ = \{x_n > 0\}$, so $\partial\Omega = \mathbb{R}^{n-1} = \{x_n = 0\}$. Want to compute DN map for Laplace equation in Ω. Consider

$$\begin{cases} \Delta u = 0 & \text{in } \mathbb{R}^n_+ \\ u|_{x_n=0} = f \end{cases}$$

Writing $x = (x', x_n)$ and taking Fourier transforms in x' gives

$$\begin{cases} (\partial_n^2 - |\xi'|^2)\,\hat{u}(\xi', x_n) = 0 \\ \hat{u}(\xi', 0) = \hat{f}(\xi') \end{cases}$$

Solving this ODE for fixed ξ' and choosing the solution that decays in ξ' (for $x_n > 0$) gives

$$\hat{u}(\xi', x_n) = e^{-x_n|\xi'|}\hat{f}(\xi')$$

$$\Rightarrow u(x', x_n) = \mathcal{F}^{-1}_{\xi'}\{e^{-x_n|\xi'|}\hat{f}(\xi')\}$$

We may now compute the DN map:

$$\Lambda_0 f = -\partial_n u|_{x_n=0} = \mathcal{F}^{-1}_{\xi'}\{|\xi'|\hat{f}(\xi)\}$$

Thus the DN map on the boundary $\mathbb{R}^{n-1}$ of $\mathbb{R}^n_+$ is just the Fourier multiplier $|\xi'|$. This is an elliptic ΨDO of order 1 (if $\psi \in C^\infty_c(\mathbb{R}^{n-1})$ satisfies $\psi = 1$ near 0, one can write

$$|\xi'| = \underbrace{(1-\psi(\xi'))|\xi'|}_{\substack{\text{smooth Kohn-Nirenberg} \\ \text{symbol of order 1}}} + \underbrace{\psi(\xi')|\xi'|}_{\substack{\text{smoothing symbol} \\ \text{(compactly supported in } \xi')}}.\;)$$