Acceleration operators.

Divergent power series $\widetilde{\varphi}(z)$ that can be resummed via the Borel-Laplace shuttle relative to z are said to be *monocritical*, with z as their 'critical variable' or 'critical time'. This default case is, mercifully, the one most commonly encountered. Still, there is no lack of problems that produce *multicritical* series $\widetilde{\varphi}(z)$, saddled with several 'critical times' z_i – say, positive powers of z ($z_i \equiv z^{\sigma_i}$). These critical z_i have to be ordered from slow- to fast-flowing: $z_1 \prec z_2 \prec ... \prec z_r$, and the resummation process now takes us successively through r convolutive models or 'Borel planes':

$$
\begin{array}{ccccccc}
\widetilde{\varphi}_1(z_1) & \leftarrow & \widetilde{\varphi}(z) & & \varphi(z) & \leftarrow & \varphi_r(z_r) \\
\downarrow \mathcal{B} & & & & & & \mathcal{L} \uparrow \\
\widehat{\varphi}_1(\zeta_1) & \underset{\mathcal{C}_{1,2}}{\rightarrow} & \widehat{\varphi}_2(\zeta_2) & \rightarrow \cdots \rightarrow & \widehat{\varphi}_{r-1}(\zeta_{r-1}) & \underset{\mathcal{C}_{r-1,r}}{\rightarrow} & \widehat{\varphi}_r(\zeta_r)
\end{array}
$$

The passage from each Borel plane to the next is via a so-called acceleration integral $\mathcal{C}_{i,i+1}$ that transmutes, on the convolutive side, the simple change of variable $z_i \to z_{i+1}$:

$$
\widehat{\varphi}_{i+1}(\zeta_{i+1}) = \int_{+0}^{+\infty} C_{F_i}(\zeta_{i+1}, \zeta_i)\, \widehat{\varphi}_i(\zeta_i)\, d\zeta_i \qquad \big(z_i \equiv F_i(z_{i+1})\big)
$$

As a rule, the 'closer' z_{i+1} to z_i, the faster $\widehat{\varphi}_i(\zeta_i)$'s rate of growth when $\zeta_i \to \infty$. Fortunately, the acceleration kernel $C_{F_i}(\zeta_{i+1}, \zeta_i)$ has, for ζ_{i+1} small enough, exactly the right rate of decrease in ζ_i to counterbalance the *accelerand*'s superexponential rate of increase. That yields the *accelerate* $\widehat{\varphi}_{i+1}(\zeta_{i+1})$ as an analytic germ at the origin, which then must – and can – be continued in the large to keep the process going. Only in the last Borel plane ζ_r do we get an accelaerate $\widehat{\varphi}_r(\zeta_r)$ with exponential growth at infinity, clearing the way for Laplace integration.