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MHD spectroscopy of moving plasmas HANS GOEDBLOED, Retired — MHD spectroscopy of the waves and instabilities of moving laboratory and astrophysical plasmas is a valuable diagnostic for the determination of the magnetic geometry of these plasmas. Whereas presently available high-resolution spectral codes are routinely exploited to compute the occurring swarms of isolated complex eigenvalues, so far, no structures connecting them were known to exist. Such structures have recently been obtained by means of the construction of the *spectral web,* consisting of a dual set of curves in the complex ω-plane with the eigenvalues on the intersections. For static plasmas, one set of the curves degenerates into the real and imaginary axes to which the eigenvalues are restricted to lie while monotonically connected through Sturm–Liouville properties of the real eigenfunctions. For rotating plasmas, the spectral web has a surprisingly involved geometry, but it does provide insight into the connection between local and global instabilities related to a novel kind of monotonicity properties of the complex eigenfunctions. All this will be illustrated by the spectral webs for force-free magnetic fields, internal kink modes of tokamaks, magneto-rotational instabilities of accretion disks, and jets ejected from compact objects.

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