Properties of Relative Spectra

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The Degree spectrum DS($\mathfrak{A}$) of a countable partial structure $\mathfrak{A}$ is the set of all enumeration degrees generated by all enumerations of $\mathfrak{A}$. The notion is introduced by *Richter* and studied by *Knight, Ash, Jockush, Downey* and *Soskov.* The Co-spectrum CS($\mathfrak{A}$) of the structure $\mathfrak{A}$ is the set of all enumeration degrees which are lower bounds of DS($\mathfrak{A}$). In [4] Soskov shows that the Degree spectra behave with respect to their Co-spectra very much like the cones of enumeration degrees. Each Degree spectrum is closed upwards. The elements of an upwards closed set of enumeration degrees $\mathcal{A}$ with arbitrary high jumps determine completely the co-set of $\mathcal{A}$. The elements of the degree spectrum DS($\mathfrak{A}$) with low jumps also determine it's co-set CS($\mathfrak{A}$). Other typical specific properties of the Degree spectra and their Co-spectra are the Minimal Pair type theorem and the existence of Quasi-Minimal degree.

We will present a generalized notion of Degree spectrum of the structure $\mathfrak{A}$, relatively given structures $\mathfrak{A}_1, \ldots, \mathfrak{A}_n$, inspired by the notion of relatively intrinsic on $\mathfrak{A}$ sets. An internal characterization of the relatively intrinsic on $\mathfrak{A}$ sets is presented in [1], [2] and in [3] with respect to the infinite sequence of sets.

The Relative spectrum $\mathrm{RS}(\mathfrak{A}, \mathfrak{A}_1, \ldots, \mathfrak{A}_n)$ of $\mathfrak{A}$ with respect to the structures $\mathfrak{A}_1, \ldots, \mathfrak{A}_n$ is the set of all enumeration degrees generated by all enumerations of $\mathfrak{A}$, such that the structure $\mathfrak{A}_k$ is relatively k-intrinsic on $\mathfrak{A}$, i.e. $\mathfrak{A}_k$ is admissible in the kth jump of $\mathfrak{A}$. We will show that this generalized notion of Degree spectra posses all general and specific properties of the Degree spectra of a structure. And we will compare this notion with the notion of Joint Spectrum of $\mathfrak{A}$ with respect to the structures $\mathfrak{A}_1, \ldots, \mathfrak{A}_n$, considered in [5], [6].

References

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