5. CONCLUSION

In frame of present PhD Theses I performed 8 new quantitative tracer tests and processed 26 of quantitative tracer tests realized in different karst areas of the Czech Republic.

Calculations of conduit volume based on tracer breakthrough curve was compared with the real volume of the phreatic loop. The best results were obtained for mean transit time, where tracer-test calculations yielded volumes very similar to the volume obtained by direct filling of the loop. It demonstrates that volume estimation by tracer tests may be quite precise for common natural conduits, but results are strongly affected by the breakthrough-curve parameter chosen by the experimenter.

.Spring and river flow hydrographs were studied by tools of statistical mathematics such analyses of recession curves, curves of exceeding and autocorrelation function applied on 77 objects (karst and non-karst springs, resurgences and streams).

Ratio of maximum to average discharge is between 1.6 and 65. In general lower values belong to spring hydrographs and higher to superficial streams. There is no possibility to determine origin of the spring (karst spring, non-karst spring, karst spring fed by with sinking streams, karst spring fed by autochthonous recharge only.

Coefficients of recession curves were calculated. For every hydrograph the maximum and the minimum coefficients were selected. Maximum coefficients are 0.014-1.2 and minimum 0.01-0.2. In both cases spring hydrographs can be distinguished from river hydrographs, but spring origin can not be distinguished.

Shapes of curves of exceeding are mainly influenced by division of hydraulic response, when total discharge is not monitored. Based on autocorrelation coefficients objects can be divided into group of streams and resurgences and group of springs but further division is impossible because of similar values in case of springs with completely different origin.

Using ratio of maximum to average discharge, coefficients of recession curves, curves of exceeding and autocorrelation the streams and in some cases the resurgences from springs can be distinguished. There is no way, however, to distinguish the karst springs from non-karst springs and to distinguish the karst springs fed by sinking streams from those not having any sinking stream in their catchment. Using these methods to characterize the karst environment seems to be therefore questionable.

6. REFERENCES

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