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Re: Doctoral thesis
Andrew Kozlík

This is a report on the PhD thesis of Andrew Kozlík; a very easy note to write. It's worth at least two PhD theses. It is a lovely collection of work. A few details are in order. I will make my comments section by section followed by a summary.

1. Latin directed triple systems. I have spent a lifetime studying Steiner triple systems and Mendelsohn triple systems. The generalization to flexible LDTSs is of enormous interest to me. Mr. Kozlík determines the spectrum for both flexible and non-flexible LDTSs. There are lots of necessary examples in this section; easy to understand.
2. Basics of DTS quasigroups: algebra, geometry and enumeration. This section is quite technical and gives many carefully explained examples of DTSs I love well thought out examples!
3. Triple systems and binary operations. A hybrid triple system (X,B) (HTS) consists of both cyclic and transitive triples. If the usual binary operations produce a quasigroup we say that (X,B) is a latin hybrid triple system (LHTS). A HTS containing both cyclic and transitive triples is called proper. One of the principal results in this sections shows that the spectrum for proper LHTS(n) is $n \equiv 0$ or 7 mod (mod 3). Again there are lots of carefully explained examples in this section.
4. Cyclic and rotational Latin Hybrid triple systems. This section determines the spectra for LDTSs and LHTSs admitting a cyclic automorphism. Lots of other interesting results as well.
5. Flexible Latin directed triple systems. The main result in this sction is the determination of the spectra for flexible LDTSs = all $n \equiv 0$ or 1 (mod 3), $n \neq 4, 6, 10, 12$. (A flexible LDTS satisfies the identity $x(yx) = (xy)x$.) Lots of carefully explained examples in this section.
6. Pure Latin directed triple systems. A LDTS is pure if when considered as a 2-fold triple system it contains no repeated blocks. In this section the spectra (modulo a few possible exceptions) is determined for both pure flexible and non-flexible LDTSs.
7. Antiflexible Latin directed triple systems. I really like this section! An anti-flexible LDTS-quasigroup is a quasigroup where the identity $(yx)y = y(xy)$ holds for the least possible

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number of ordered pairs (x,y). Quoting from the paper: "In a sense, anti-flexible LDTSs are LDTSs which are as distant from STSs as possible." The author goes on to show that the spectrum for anti-flexible LDTSs is precisely all n≡0 or 1 (mod 3). Once again, this section ends with lots of easy to understand examples; necessary for the main result.

8. The centre of a Steiner loop and the maxi-Pasch problem. This topic is not my cup of tea so I will not make any comments.

CONCLUDING REMARKS AND RECOMMENDATION

This thesis contains a fantastic collection of results and, as I said on page 1, is worthy of at least two PhDs. Mr. Kozlík might want to consider blending the first 7 sections into a huge survey paper or a monograph. This would be of interest to people in both algebra and design theory.

Regards,

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