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Wireless has inspired many problems in the construction of sequences and codes. Recently, the prospect of “cognitive radio” has emerged — systems that can adaptively change their own characteristics based on the local environment. This has been metaphorically compared to the shift from single-track railroads to multi-lane highways where diverse users can share the road responsibly. A new need looms for the wireless equivalent of license plates: codes that can appropriately identify users so that mechanisms can be deployed to enforce good behaviour.

These codes enable radios to share resources, but the way this sharing occurs is different from traditional spread-spectrum approaches. So despite some similarities, what is needed is different from the spreading sequences used for CDMA. A careful look at the interaction of such codes with potential enforcement mechanisms also reveals that their desirable properties resemble Ahslwede’s aptly-named “Identification Codes” more closely than they do traditional error-correcting codes. This talk will explain the desired properties as well as present preliminary results. Random-coding constructions tell us that good codes must exist, but to be useful, explicit algebraic or possibly graph-based constructions are needed. (Received September 22, 2009)