HARMONIC DYADIC ANALYSIS

JEAN CARLO MORAES

1. Important operators in Harmonic Analysis: Hilbert transform, Hardy-Littlewood maximal function, square functions, paraproducts, dyadic maximal function, dyadic square functions, dyadic paraproducts.

2. Schur's Lemma, Cotlar's Lemma, Calderón-Zygmund decomposition, interpolation, extrapolarion;

3. BMO^d, A_p^d, $Carl_{u,v}$ spaces;

4. $T(1)$ theorem and Carleson's Lemma;

5. Bellman functions;

6. Weighted inequalities.

References

[1] O. Beznosova, *Linear bound for the dyadic paraproduct on weighted Lebesgue space $L^2(w)$*. J. Func. Anal. **255** (2008), 994–1007.

[2] O. Beznosova and A. Reznikov, *Equivalent definitions of dyadic Muckenhoupt and Reverse Holder classes in terms of Carleson sequences, weak classes, and comparability of dyadic $L\log L$ and A_∞ constants* Rev. Mat. Iberoamericana, Volume 30, Issue 4 (2014) 1191–1190.

[3] D. Cruz-Uribe, J. Martell, and C. Pérez, *Sharp weighted estimates for classical operators*. Advances in Mathematics **229**, (2012), 408-441.

[4] J. García-Cuerva and J.L. Rubio de Francia, *Weighted norm inequalities and related topics*. North-Holland Mathematics Studies **116**, Amsterdam, 1981.

[5] J. C. Moraes, *Weighted estimates for dyadic operators with complexity*. PhD Dissertation, University of New Mexico, 2011.

[6] M. C. Pereyra, *Lecture notes on dyadic harmonic analysis. Contemp. Math.*, 289:1-60, 2001.

[7] M. Wilson, Weighted Littlewood-Paley Theory and Exponential-Square Integrability. *Lecture Notes in Mathematics, 1924. Springer, Berlin*, 2008.

[8] A. Volberg, *Bellman function technique in Harmonic Analysis. Lectures of INRIA Summer School in Antibes, June 2011.* Preprint (2011) available at arXiv:1106.3899

[9] J. Wittwer, *A sharp estimate on the norm of the martingale transform*. Math. Res. Letters, **7** (2000), 1–12.